The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. XIV. No. 349 FEBRUARY 20, 1926 Prepaid Annual Subscription: United Kingdom, £1.1.0; Abroad, £1.6.0.

Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

The prepaid subscription to THE CHEMICAL AGE *is 21s. per annum for the United Kingdom, and 26s. abroad. Cheques, Money Orders and Postal Orders should be made payable to Benn Brothers, Ltd.*

Editorial and General Offices—8, *Bouverie St., London, E.C.4.*

Telegrams: "Allangas, Fleet, London." Telephone: City 9852 (6 lines).

Urea Production *via* Cyanamide

IN a recent editorial note, "The Chemical Engineer 'Arrives,'" attention was drawn to the remarks of Sir William Pope to the effect that the cyanamide industry, which came into existence practically without the collaboration of the academic chemist, may some day furnish urea as the ideal fertiliser. We now learn that not only is urea being produced on a technical scale *via* cyanamide, but, curiously enough, that the process has been developed as the result of research and the continued work of industrial, as distinct from academic, chemists. Calcium cyanamide is transformed into free cyanamide by means of carbonic acid, thus:—

$$CaCN_2+H_2CO_3=N:C\cdot NH_2+CaCO_3.$$

Subsequently the free cyanamide is hydrolysed by means of sulphuric acid of a specific strength, which has the effect of increasing the speed of reaction, and the resulting product is urea-sulphuric acid. The reaction may be represented thus:—

$$N:C\cdot NH_2+H_2O+H_2SO_4=CO\begin{matrix}NH_2\\NH_2\end{matrix}+H_2SO_4$$

The next step is the separation of the urea from urea-sulphuric acid. The complete process, involving the production of calcium carbide from lime and coke and the fixation of nitrogen in the production of calcium cyanamide, is one that involves cheap hydro-electric power. Given this, there is no reason why urea should not be produced at an economic price.

The two reactions represented above, as well as the separation of urea from urea-sulphuric acid, are more complicated than the equations denote. Apart from the main reactions already indicated, under certain conditions it is known that secondary reactions occur. These produce dicyandiamide, dicyandiamidine, urea salts, and ammonium salts, and the yield of urea, as such, is reduced. Investigations have revealed how the secondary reactions can largely be obviated. The separation of urea from its sulphuric acid solution is by no means so simple as the separation of a soluble salt from its solution. According to temperature conditions and the concentration of the solution, one may obtain either ammonium sulphate or urea sulphate. A physico-chemical study alone discloses the precise conditions by which urea can be isolated from its sulphuric acid solution. A determination has been made of the solubility range of the ternary mixture—water-urea-sulphuric acid—and from this a process has been devised, which is the subject of E.P. 189,787. The advantage of this process is that it renders possible the regeneration of sulphuric acid from the sulphuric acid solutions of urea. The recovered acid can be used again in the process.

Prior to the development of this method, urea was separated by treating its sulphuric acid solution with lime, which led to the production of calcium sulphate. This was a wasteful process, inasmuch as valuable products—lime and sulphuric acid—were converted into calcium sulphate, a by-product of little value. But there were other disabilities accompanying this method. The concentration of the alkaline solution remaining after the removal of the precipitated calcium sulphate invariably resulted in an appreciable loss of ammonia. Moreover, it was never possible to recover the urea in a commercially pure form. It was always contaminated with calcium sulphate. It is known that the conversion of cyanamide into urea by the process described is tolerably cheap, and that the plant required is not of a highly specialised character. The unit processes involved are respectively carbonation, filtration, evaporation, crystallisation and drying. From a chemical engineering point of view it is not a difficult matter to design plant of a presentable appearance which will be efficient and economical in operation. We believe a small plant has been working at Martigny, in Switzerland, and that much valuable information has been accumulated, which will be taken advantage of when the time is opportune for an extension of this fascinating process.

It must not be assumed that the process here outlined is the only one relating to the manufacture of urea that is attracting attention at the present time. There are other processes in the field that are peculiarly suitable for works producing synthetic

ammonia where pure gaseous ammonia under considerable pressure is available. Some reference may possibly be made to this at a later date. Meanwhile, the charm of chemistry and chemical engineering lies in the fact that the manufacture of a new compound is not necessarily confined to one process, but, on the contrary, can be obtained by different methods and with plant and raw materials that are specially adapted to certain geographical areas.

The Jaques-West-Morgan Process

THE letter from Dr. A. Jaques and Mr. J. S. Morgan, which appeared in our correspondence columns last week, draws attention to a process designed for the direct recovery of ammonia, which to our minds has little in the way of a parallel from the point of view of ingenuity. For many years the ammonia producer has been striving after the ideal of effecting fixation of his product without having to be dependent upon the introduction of sulphuric acid, derived in most instances from external sources. In pursuit of this ideal both Feld and Burkheiser came within sight of success over a decade ago. In fact, their processes were operated on a commercial scale, and apparently with little difficulty, in Germany, but although they were introduced at certain works in this country they do not seem to have gained sufficient favour to warrant anything approaching general recognition. The history of direct (as distinct from semi-direct) recovery has, indeed, been somewhat disappointing in this country, but there is every reason to suppose that a solution will ultimately be found, and that it will in all probability lie in the combination of ammonia and sulphur dioxide to yield a sulphite salt. Up to the formation of the ammonium sulphite the way is comparatively clear, but there is, in view of earlier experience with the Burkheiser process, a little hesitation in accepting the fact that the whole of the sulphite can be readily oxidised to the sulphate.

It is, therefore, a matter for considerable satisfaction to hear from Dr. Jaques and Mr. Morgan that previous experience with other methods has no bearing upon the Jaques-West-Morgan process (which is the subject of English patent No. 215,470, dated February 16, 1923). The *rationale* of the method is, of course, fully described in the specification, but as it has not received nearly the publicity which its ingenuity demands it is worth while drawing attention to the salient features. In brief, ammonia vapour and water vapour (or liquid water in a fine state of division) are brought into a reaction chamber, where they come into contact with a gaseous mixture comprised of sulphur dioxide and air, the temperature of reaction being just below 100° C. The concentration of sulphur dioxide (which in the majority of industrial cases would be obtained from burner gases) is about 4 per cent. of the total volume of gases, and as a result of interaction between the acid and alkaline vapours a cloud of ammonium sulphite is formed, which is precipitated in receptacles situated at the base of the reaction chamber. This ammonium sulphite is in a highly reactive physical condition and may be rapidly oxidised to ammonium sulphate by contact with air.

In their letter Dr. Jaques and Mr. Morgan point out that with synthetic (*i.e.*, pure) ammonia, the oxidation process proceeds rapidly, but with by-product ammonia the rate of oxidation is slowed down and the end product is of a cruder nature, containing various compounds (such as thiosulphate) at which, in these days of high standards, the rather suspicious consumer might look askance. This, of course, is another instance where the synthetic producer finds himself at an advantage, but in order to eliminate the use of sulphuric acid it might well be an economic proposition for the by-product producer first to purify his ammonia prior to passing it to the reaction chamber. One feels, indeed, that there must be many such producers who would welcome a statement as to the most practicable means for effecting purification, and particularly as to whether the cost of operating the plant plus the cost of purification would still leave a satisfactory margin over the outlay incurred with the stereotyped process. It is well known, of course, that the inventors have an industrial scale plant operating in the north of England, and we should be glad, for the benefit of those of our readers who have expressed interest in the matter, to give publicity to any figures, acquired as a result of practical experience, with which the inventors may like to furnish us.

The Break in U.S.A. Ammonia Prices

WHEN last autumn the price of anhydrous ammonia —one form in which ammonia is marketed in the United States—suddenly dropped fifty per cent., both producers and consumers, although supplies had fast been overtaking demands, suffered a distinct shock. According to a well-informed summary of the situation in *Drug and Chemical Markets*, consumers, who have been saved some four and a half million dollars, attribute the drastic cut to the output of the new synthetic plants. The situation has developed rapidly. It is only five years since the Casale process for the commercial synthesis of ammonia from electrolytic hydrogen was first offered to American makers. Later the Claude process was introduced. The production costs of these as well as of the older Haber and Haüsser processes were quite freely discussed. Even four years since, the larger American ammonia consumers intimated, at a contract conference with the producers, that they considered the prices then too high, and it is now suggested that a moderate reduction then might have delayed the development of the synthetic production and ensured an orderly retreat instead of a price rout.

During the past two or three years the American output has grown enormously, but an increasing demand has prevented the situation from becoming acute. The older producers were not anxious to break the market; neither were the newer makers, on account of their heavy capital charges arising from the cost of research and the installation of costly plant. But the balance maintained up to last autumn was rudely disturbed by the decision of two of the synthetic producers materially to increase their outputs in 1926, and the expectation that the new Lazote plant, employing a modification of the Claude process, would be in production before another contract season arrived. When two of the largest consumers suddenly changed their source of supply for 1926, the crisis arose.

The question our New York contemporary raises is

whether there will be a recovery. Some slight improvement is considered probable, because production costs at the present selling prices are said to show an inadequate return, but the ultimate remedy is looked for in wider commercial applications for ammonia, such, for example, as refrigeration, and the production of ammonia in other forms. But America, like other countries, has begun to look to agriculture as the field that promises the largest increase in the consumption of ammonia in the form of sulphate. The producers of by-product ammonia in America are feeling the effect of the competitive synthetic product, as they are elsewhere, and the opinion, recently expressed in THE CHEMICAL AGE by Mr. P. Parrish, that by-products plants cannot be profitably operated with an output of less than 750 tons, is strongly commended to the attention of American producers. The temporary dislocation of markets by new processes is, of course, a familiar story in many industries. Usually, in the end, the problem works itself out, but the process in the case of ammonia of adaptation to new conditions promises for some time to come to be of great interest.

B.D.C. Courses for Students

SOME time ago attention was drawn in THE CHEMICAL AGE to an interesting experiment made by the British Dyestuffs Corporation for enabling university students to obtain some direct knowledge of works practice by means of summer courses in the Corporation's laboratories and works. In view of the attention now being given to the problem of linking up university training more intimately with factory or works practice, such experiments are of great value and interest. Last year's courses, as we announced at the time, were regarded as a distinct success, and it is satisfactory to hear that this year again the Corporation are prepared to grant facilities to a limited number of university students taking honours schools in chemistry, who have completed the second year of their course, to enable them to gain an insight into chemical works practice. The students must be of British birth, have no direct connection with the dyestuffs industry or industries competing with the Corporation, and they must be recommended by their professor of chemistry. They will, on completing the course, be expected to furnish the Corporation with a report on their experiences, of which no publication should be made without first obtaining the consent of the Corporation.

Students will be grouped in pairs, each pair being allowed to spend a week or more in the analytical laboratory, the research laboratory, one or more works laboratories and corresponding plant, the works cost office, the dyehouse, and the engineering drawing office. Applications, on prescribed forms, have to be returned to the Corporation at 70, Spring Gardens, Manchester, marked "Vacation Course," not later than May 1 next. If sufficient applications are received, courses will be arranged for the periods July 1 to 28, and September 1 to 30. Applicants should state which period they are applying for. Students will be expected to observe all the rules and regulations in force in the factories and laboratories of the Corporation. These facilities are offered during the months of July and September only. No applications can be entertained for the month of August.

Books Received

THE "EXPRESS" PER GROSS AND PER DOZEN RECKONER. By J. Gall Inglis. London and Edinburgh: Gall and Inglis. 2s. 6d.

CRYSTALLINE FORM AND CHEMICAL CONSTITUTION. By A. E. H. Tutton. London: Macmillan and Co., Ltd. Pp. 252. 10s. 6d.

PERFUMES, COSMETICS AND SOAPS. Vol. II. A Treatise on Practical Perfumery. By William A. Poucher. London: Chapman and Hall, Ltd. Pp. 406. 21s.

THE NATIONAL SIGNIFICANCE OF ELECTRICITY. London: The British Electrical and Allied Manufacturers' Association (Inc.). Pp. 36.

REPORT ON THE FINANCIAL, COMMERCIAL AND ECONOMIC CONDITIONS OF THE ARGENTINE REPUBLIC, SEPTEMBER, 1925. H. O. Chalkley. London: H.M. Stationery Office. Pp. 90. 2s. 6d.

The Calendar

Feb.		
22	Royal Society of Arts: Cantor Lecture — "The Production and Measurement of High Vacua." Dr. G. W. C. Kaye. 8 p.m.	John Street, Adelphi, London.
22	Faraday Society: Ordinary Meeting. 5.30 p.m.	Burlington House, Piccadilly, London.
22	Institute of Chemistry (Manchester Section): Professor H. E. Armstrong.	Manchester.
23	Society of Chemical Industry (Birmingham Section): "The Heat Reactions occurring during the Vulcanisation of Rubber." A. A. Perks.	The University Buildings, Edmund Street, Birmingham.
23	Northern Polytechnic Chemical Association: Open Discussion. 8 p.m.	Holloway, London.
24	Royal Society of Arts: "Domestic Heating." Dr. Margaret Fishenden. 8 p.m.	John Street, Adelphi, London.
24	Office Machinery Users' Association: "Technical Libraries and Information Bureaux." R. Borlase Matthews. 6 p.m.	London School of Economics, Houghton Street, Kingsway.
24	Society of Chemical Industry (Nottingham Section) Joint Meeting with the Midlands Section of the Society of Dyers and Colourists: "Further Experiments on the Chlorination of Wool." S. R. Trotman and E. R. Trotman. 7.30 p.m.	University College, Nottingham.
24	Institute of Chemistry (Birmingham Section): "Experiences of a City Analyst." J. F. Liverseege. 7.30 p.m.	Chamber of Commerce, New Street, Birmingham.
24	Institute of Chemistry (Belfast Section): "Micro-Analytical Methods." Professor Milroy. 7.30 p.m.	Queen's University, Belfast.
24	Society of Chemical Industry (Newcastle-on-Tyne Section): "Some Further Evidence of a Variation in the Atomic Weight of Boron." Dr. H. V. A. Briscoe and P. L. Robinson. 7.30 p.m.	Armstrong College, Newcastle-on-Tyne.
25	Royal Society: 4.30 p.m.	Burlington House, Piccadilly, London.
25	Institute of Chemistry Students' Association (London): Address by F. H. Carr. 8 p.m.	30, Russell Square, London, W.C.
26	Society of Chemical Industry and Institute of Chemistry (Glasgow Sections): "Soil Nitrogen." Professor R. A. Berry. 7 p.m.	39, Elmbank Crescent, Glasgow.
26	Society of Chemical Industry (South Wales Section): "Some Notes on Pure Chemicals." E. A. Tyler. 7.30 p.m.	Technical College, Swansea.
27	British Association of Chemists (London Section): Annual Dinner. 6.30 p.m.	Engineers' Club, London.

Opening of the British Industries Fair of 1926

General Impressions and Prospects

On Monday the British Industries Fair for 1926 opened simultaneously at London and Birmingham and will continue until Friday, February 26. The London Section is housed at the White City, Shepherd's Bush, and the Birmingham Fair is at Castle Bromwich. The hours are from 10 a.m. to 8 p.m. each day, Sunday excluded, and for the first time in the history of the Fair the public are admitted after 5 p.m. at a nominal charge. The Department of Overseas Trade, which is responsible for the organisation, reports a very satisfactory response. There are now 800 exhibitors in the London section, a great increase on the figures for two years ago, and the response from overseas buyers has increased. This year 44 countries are actively represented; Canada sends the largest number, with Holland and the U.S.A. occupying the next two places.

There was no official opening ceremony on Monday. For the first day, the Exhibition was much more finished than is generally found at such functions, and displays were for the most part well planned and effective. The long, straggling plan of the buildings is a disadvantage from the visitor's point of view, but at least it prevents overcrowding in the various sections. The general view was that the admission of the public was a forward step, as an educated public opinion and a knowledge of developments and progress are assets to trade.

On Tuesday the Prince of Wales visited the Fair and was received by Sir William Clarke and other officials. He spent two hours on a tour of the various sections and said that he was certain the Fair would do much for British industry; "and while not professing to speak as an expert as to the excellence of the show, I am convinced that experienced traders will fully endorse my opinion."

The Prince of Wales was the chief speaker at the banquet held at the Mansion House on Monday evening to inaugurate the Fair. Sir P. Cunliffe-Lister, President of the Board of Trade, presided. The Prince characterised export trade as the "health of life" of this country and the whole world, and he urged that overseas markets for British goods be exploited to the uttermost, while on the home buying public he urged the necessity for purchasing British goods "first and all the time." Sir Austen Chamberlain said that frankly they were assembled to boost the country, and perhaps it was time they did so. There was too much self-complacency and pessimism which was often quite unnecessary.

The Chemical Section of the Fair is confined to London and is conveniently situated just inside the Shepherd's Bush or Uxbridge Road entrance to the building. The number of exhibitors exceeds that of two years ago but, after Wembley's considerable proportions, appears small. The hall is flanked by stands and there is a series of island stands down the centre. Space is adequate and lighting is good. Some of the exhibitors have not progressed past the rows of bottles stage, but in others there is seen a welcome originality. "At the Sign of the Benzene Ring"—a delightful ancient hostelry—may be found the less romantic products of the South Metropolitan Gas Co. The chemical by-products of the gas industry are also well represented in the exhibit of the largest gas organisation in the world—the Gas Light and Coke Co. As mentioned in our detailed survey of the exhibits, Thomas Morson and Son show new "Wheels of Industry" and Boake, Roberts and Co. have introduced floral decorations with effect.

The bulk of the exhibits may safely be described as more in the medical and pharmaceutical fields. There is, for instance, a wide range of medicinal products and new products for tropical and specific diseases. Others show fine chemicals for toilet preparations, medicine, and pharmacy. The needs of the disinfectant industry are catered for but dyestuffs are poorly represented, although there are complete ranges of harmless aniline dyes for foodstuffs. There is a new silicon ester stone preservative and acid calcium phosphate of hitherto unattained purity. A new aspirin product with special solubility and mixing properties is exhibited. Details of the leading stands are given in the notices that follow. It will be seen that there is a complete absence of chemical plant, which is unfortunate also from a display point of view. Gas works are adequately represented, but the heavy chemical side can hardly be said to be prominent.

What particularly strikes the chemical visitor to the chemical section of the Fair is the remarkable range of chemicals now manufactured in this country. The bad old days, when the chemist who required anything unusual automatically and wearily wrote to Kahlbaum about it, have gone, never to return. As one of the exhibitors remarked, when comment was made on the large number of chemicals he showed, "We *make* these things. We don't catalogue them and import them from Germany." This spirit of enterprise is obvious in every department—inorganic chemicals, organic chemicals, research chemicals, chemicals for analysis, etc. The chemist is likely to feel particular satisfaction in the surprisingly large number of firms who exhibit reagents of guaranteed purity for analytical purposes. Analysis is the bread and cheese of many a chemist's daily routine, and it is good to know that he need no longer be hampered by lack of pure British-made reagents.

Further evidence of enterprise in British industry is shown by the extensive exhibits of medicinal preparations, both of synthetic and natural origin. In this direction manufacturers in this country have always shown great activity, and it is satisfactory to see that they are keeping so closely in touch with research in chemical therapeutics that substances only recently discovered are almost immediately put on the market. A similar spirit is shown by the manufacturers of chemicals for research. It is a peculiarly thankless task to make 50 grams of a material which can only be obtained by a very involved and laborious series of operations, especially if nobody is at all likely to want another 50 grams for years to come. The effort made to cope with this section of the trade is reflected in the astonishing array of weird and wonderful products, with names calculated to strike terror into the heart of the layman, which appear on many stands.

An increasing number of firms show a desire to meet the researcher more than half-way, and to prepare any known product to his order. In past years chemists have been forced to waste a great deal of valuable time in preparing known but difficultly accessible substances as a preliminary to real research; the enterprise of manufacturers in this direction is of great importance to the successful and rapid prosecution of scientific research in this country. Apart from general chemicals, there are certain special lines of great interest. There are exhibits of a very wide range of essences, perfumes and flavouring matters, both natural and synthetic.

While this exhibition is primarily for industrial purposes, it is to be hoped that the general public may be induced to take an interest in it. It is very easy of access. In particular, it would be an excellent thing if chemical students, some of whom will help to create future exhibitions, could be brought into contact with the Fair. It would give them a proper respect for British manufacturers, and help to eradicate from their minds the idea of "Deutschland über alles" in chemical industry.

The King and Queen visited the Fair on Thursday and accompanied by Sir Philip Cunliffe-Lister, President of the Board of Trade, and Mr. Claude Taylor, secretary of the Fair, spent some two hours in a tour of the various sections. This practical interest of the Royal Family has done much to stimulate trade and is greatly appreciated by exhibitors.

Features of the Leading Chemical Exhibits

A. Boake, Roberts and Co., Ltd.

THIS well-known firm have endeavoured adequately to represent each of the many groups of products that they manufacture, as owing to the very large and rapidly increasing number of such products it is not possible to show a sample of each one.

Technical representatives will be in attendance throughout the Fair to give all available information, and the firm will be very pleased if customers, both present and potential, will make use of their services.

Amongst the exhibits will be found the following:—Soap and perfumery chemicals: an extensive range of isolates, synthetics, terpeneless and essential oils. Pharmaceuticals shown include natural and synthetic menthol and esters, thymol, alcohol substitutes, acetic acid, paraldehyde, and essential oils, etc.

The application of cellulose lacquers is rapidly extending, and there is always an interest in new products. The firm are showing many that will be new to some users, in addition to those already in general use. Liquid sulphur dioxide is to be shown in both glass and iron containers, also a range of sulphates, bisulphites, and metabisulphites. Abrac ester gum, owing to its high quality, is in rapidly increasing demand. It is of uniformly pale colour, acidity less than 5, entirely free from lime. The resinates and linoleates, etc., are also uniform in quality, and contain guaranteed metal contents.

The textile and silk chemicals on view include phosphates, sulphites, acetic acid, acetic anhydride, acetins, chlorhydrins, Turkey Red oil, sodium acetate, solvents and plasticisers. Intermediates in large variety cover iso butyl alcohol, benzyl alcohol, sulphuryl chloride, sodium acetate anhydrous, and sulphur dioxide.

Other features include essential oils and oleo resins, for mineral waters, cordials, fruit wines, syrups, liqueurs, confectionery, biscuits, tobacco, and culinary purposes.

Sulphonated oils are given a prominent display, as are Shawinigan products, including acetic acid, technical, edible and glacial, and carbon black.

On the first day of the Fair we were particularly interested in the arrangement of numerous bowls of exquisite flowers and fruits of all descriptions. The combination of science and nature was not only distinctly enterprising and attractive but it struck a new note in an industry which is comparatively ill-suited to display work.

May and Baker, Ltd.

May and Baker, Ltd., of Battersea, S.W., display fine chemicals. All their drugs answer the requirements of the Pharmacopœias in which they are included. Of special interest are the exhibits of pure ether and chloroform for anæsthesia; bismuth salts, including carbonate, salicylate, and subnitrate, of very low density. Mercurials are shown in great variety—bichloride, granular, spongy, and in mass form; subchloride (calomel), an impalpable powder absolutely free from bichloride; and oxides, yellow and red, specially adapted for anti-fouling compositions. Mercurochrome, a mercury compound of fluorescein, is a powerful antiseptic of low toxicity. Copper suboxide, made by the wet process, is not subject to colour changes on keeping and is absolutely free from metallics. Saponin and other glucosides are manufactured on a large scale, and arsenicals include Novarsenobillon ("914"), Arsenobillon ("606"), and Arseno-Argenticum (Silver Salvarsan), the Bismuth preparations Bisglucol (suspension of metal), Luatol, and Rubyl. Bistovol is a compound of arsenic and bismuth. Tryparsamide is another arsenical shown.

Johnson and Sons (Manufacturing Chemists), Ltd.

This firm are displaying goods only such as are required in photographic and process engraving, fur dyeing, tanning and textile industries; also for metallurgical and works' laboratories.

These include, amongst others, acid pyrogallic, Amidol-Johnsons, hydroquinone, process glue, paramidophenol, Metol-Johnsons, iron perchloride, varnishes. Test papers of every description are shown, also salts of precious metals such as gold chloride and silver nitrate. Photographic preparations ready for the retail counter, such as solutions, packets, scaloids, etc., are another feature.

Howards and Sons, Ltd.

New chemical products—that is to say, chemicals which have not previously been manufactured in this country—are among those shown by Howards and Sons, Ltd., of Ilford, near London, which firm has been established since 1797. The new articles are the Cyclohexanol group of solvents, which are attracting so much attention just now and consist of Cyclohexanol Pure, Cyclohexanol Commercial (Sextol), Cyclohexanol Acetate (Sextate), Cyclohexanone (Sextone) and their isomers, and demonstrations are given of their power as solvents of fats, oils (fixed, mineral and essential), waxes, resins (including hard copal gums), rubber, celluloid, synthetic resins, nitrocellulose, etc., also in the manufacture of soaps for laundry and textile purposes, wool scouring, felt and yarn scouring, dry cleaning, silk degumming, etc.

Very important features of these solvents are, firstly, the fact that they are much safer to use than the present solvents from the point of view of inflammability, and, secondly, the saving effected in working costs through lower price and greater working efficiency.

Other preparations shown are Howards' Thymol, a very pure article in beautiful crystals, guaranteed to pass all B.P. tests, and Synthetic Menthol, which was first manufactured and placed on the world's markets by the company. This product crystallises in detached needle-shaped formation possessing the characteristic pungent peppermint odour and chemically identical with the natural article, differing from it only in the lower melting point and absence of optical activity. The demand for this product is very great in view of the price, which is considerably lower than that of the natural menthol, and is not subject to the speculative fluctuations characteristic of the latter.

Among other preparations shown are aspirin, acid boric, agotan, Avantine brand of isopropyl alcohol, bismuths, caffeine, calcium lactate, calomel, camphor, Epsom and Glauber salts, hydrogen peroxide, iodides, mercurials, quinine salts and tablets, and medicinal tablets of all kinds.

Hopkin and Williams, Ltd.

Hopkin and Williams, Ltd., of 16 and 17, Cross Street E.C.1, exhibit guaranteed standard chemical reagents for scientific and research purposes. Specimens include adipic acid, cyclo-hexyl chloride, thioacetanilide, methyl-benzo-thiazole, chromic acid free from sulphate, arsenic-free zinc for forensic purposes, tetra-iodo and tetra-bromo phenol phthalein, anthranilic acid, ethyl-benzene, hydrazine hydrochloride, alpha- and beta-naphthylamines, nitroso-beta-naphthol, potassium hydrogen phthalate, thallium carbonate, para-toluidine, para nitro-phenol phthalein, cuprous chloride, mandelic acid, amino-azo-benzene, hippuric acid, glycine and other compounds recently produced by the company. Indicators for volumetric use are shown, also salts and compounds used in the glass and ceramic industries. Monazite sand containing 9½ per cent. thorium oxide, ilmenite containing 55 per cent. titanium oxide used for the manufacture of titanium pigments to replace white lead in paint, and zircon mineral used as a refractory in the construction of furnaces for high temperature work, are other features proposed. Thorium and cerium salts, cerium oxides for optical glass, technical salts of cerium for tanning, dyeing, waterproofing, and photography, and mesothorium used in making luminous compounds will be shown.

The Graesser-Monsanto Chemical Works, Ltd.

The Graesser-Monsanto Chemical Works, Ltd., of Ruabon, North Wales, besides showing leading lines in phenol, cresol and their derivatives used in the pharmaceutical, disinfectant, dye and technical industries, have on view many interesting specialities. A new product, pure acetyl salicylic acid, registered as Aspirgran, eliminates the labour and trouble of granulation. It can be dry mixed and fed straight into the machines. Its easy-flowing properties are demonstrated by the steady flow from an aperture which can be started with the slightest touch. Hydrolysis due to granulation and subsequent drying is avoided. Vanillin-Monsanto is sold under a guarantee of 100 per cent. purity. To interest mineral water manufacturers there is Saccharin-Monsanto which is about 550 times stronger than sugar.

Whiffen and Sons, Ltd.

The exhibit of this firm consists of pharmaceutical and technical fine chemicals, manufactured at their Battersea and Fulham Works. The specimens are commercial samples and representative of bulk supplied in execution of orders. The firm comprises the original business of Thomas Whiffen, established in 1859 at Battersea, with which is incorporated the much older business of George Atkinson and Co., established as far back as 1654 and acquired by the late Thomas Whiffen in 1887. Prior to 1884, whilst manufacturing was permitted within the city boundaries, George Atkinson's factory stood at No. 66, Aldersgate Street, E.C. In 1884 it was removed to Southall and remained there until 1923, when it was removed to the present modern riverside premises at Carnwath Road, Fulham, which still preserve the original title of "Aldersgate Chemical Works."

Among the items of outstanding interest to visitors are specimens of the halogens, viz., iodide and bromide preparations in a wide range and forming one of the staple products of the firm, in which they have specialised during the greater portion of a century. Also vermilion in all shades from pale orange to deep red will be shown, and some of the specimens have been exposed to light for more than fifty years without deterioration. The firm have details of transactions in vermilion two centuries old still among their records.

Among other distinctive specimens will be noticed caffeine in masses of unbroken acicular crystals; emetine and the principal salts, standard preparations for hypodermic administration in amœbic dysentery and hepatitis; quinine salts to satisfy the various official standards, and the manufacture of which has been carried on at the Battersea works for upwards of 70 years; nicotine for horticultural purposes; pure nicotine for medical use, and the salicylate and tartrate salts for treatment of skin disease; strychnine and salts in bulk and in 1-ounce bottles, of which Whiffen and Sons claim to be the oldest British manufacturers; salicin, the active principle of willow bark, discovered by Leront in 1830, and first manufactured by Thomas Whiffen in 1876; and camphor, resublimed from the crude, in all forms—namely, bells, tablets, and flowers.

Other interesting specimens include Atropine, both pure and sulphate, Hyoscine and Hyoscyamine, Theobromine, Prunella balls in new sizes, and samples of essential oils.

Thomas Tyrer and Co., Ltd.

Thomas Tyrer and Co., Ltd., of Stratford, E.15, manufacture pharmaceutically pure bismuth carbonate in densities varying from 50 lb. per cubic foot and as low as 9 lb. per cubit foot—this latter being the bulkiest made. They will draw attention to two special reagents—soda bismuthate and soda nitroprusside. Though not used in very large amounts, they are none the less of great importance and demand exceptional care in their manufacture. Such chemicals as iron ammonium citrate (green scales) and ferric ammonium oxalate—both widely used in blue print and similar processes—require great care and non-actinic conditions in their manufacture in order that a suitable and reliable product may be produced. Soda and potash citrates are widely used in food products. Cobalt compounds are now generally admitted to be the finest and most satisfactory "driers" for paints, varnishes, etc. The acetate, linoleate and resinate are all extensively used. Nickel is almost exclusively used in the hardening and hydrogenation of fats and oils as the catalyst—the formate, acetate, carbonate and nitrate being used for the preparation of the catalyst in active form.

Williams (Hounslow), Ltd.

Williams (Hounslow), Ltd., are exhibiting aniline dyes in all shades and suitable for all industries. The firm has a special department for matching shades and samples, and this service has already matched no less than 70,000 shades.

This firm specialises in harmless colours for confectionery and foodstuffs generally. All the intermediates for these products are specially manufactured by the firm to avoid contamination, and the finished colours all conform to the latest requirements of the Ministry of Health and of the Scottish Board of Health. Their aniline dye products are soluble in water, spirit, oil, fat, etc., and a particularly interesting exhibit is a wax soluble colour which is non-blooming. Nigrosine is a speciality, and Induline and Chrysoidine are exhibited, also a wide range of leather dyes and dyes and colours for polishes, printing inks, inks, etc.

F. Allen and Sons (Poplar), Ltd.

Frederick Allen and Sons (Poplar), Ltd., show Epsom salts made direct from magnesite by means of purified vitriol and the solutions are subjected to several purification processes before they are concentrated for crystallisation. They are in the form of needle crystals, dried without being exsiccated, bright, glistening, and free-running.

W. J. Bush and Co., Ltd.

This company's exhibit may be divided into two main groups, namely, essences, essential oils, and perfumes, and fine chemicals. Essential Oil of Lemon produced at their Messina factory; peppermint, distilled at their Mitcham factory, and various fruit essences are included. Prominent among perfumery Fine Chemicals is vanillin, of which this company is the oldest British maker. Coumarin, thymol, ionone are exhibited. Certain important intermediates for dye manufacturers are shown, including salicylic acid, aceto acetic ester, sulphanilic acid and benzyl chloride. Among synthetic drugs are salicylic acid, soda salicylate, acetanilide and methyl salicylate. The comparatively new industry of nitro-cellulose varnishes and polishes is being catered for in the production of a range of solvents of which butyl, amyl, and ethyl acetates are important examples. Triphenyl phosphate and benzyl alcohol are shown.

British Drug Houses, Ltd.

The exhibit of the British Drug Houses, Ltd., comprises specimens illustrative of the wide range of fine chemical and pharmaceutical products manufactured. "Borocaine," the new local anæsthetic, is the result of research work carried out at Cambridge University, and is exhibited in the three forms, viz., powder; 2 per cent. sterile solution; and tablets of two strengths. "Caprokol" (Hexyl-Resorcinol B.D.H.) is a new urinary antiseptic. It has 45 times the germicidal power of phenol and is non-toxic in therapeutic doses. As the result of researches this British firm has evolved a method of producing an entirely new quality of ether, quite free from peroxides, which, although manufactured on a large scale, maintains what is practically the purity of a research chemical. Other exhibits include insulin alkaloids, laboratory chemicals and microscopic stains and dyes.

Thomas Morson and Son, Ltd.

Thomas Morson and Son, Ltd., of 47, Gray's Inn Road, W.C., show colloidal aluminium silicate prepared by the patented electro-osmose method, and marketed under the name "Osmo-Kaolin." As a colloidal colour basis Osmo-Kaolin is proving of interest to users of dry colours. Its behaviour with organic and inorganic colours is exceptionally interesting, and some important developments may be anticipated. Cadmium colours are not new, but recent improvements in technique have brought the possibility of their use within the range of application to processes from which they have been debarred hitherto on account of high cost. The Osmo-Cadmium colours offer a new range of shades from pale yellow through orange to scarlet and deep reds, all possessing the useful properties of stability to light and heat with a high resistance to chemical change.

An effective method of display has been found by this firm which is known as "The Wheels of Industry." These large raised, revolving wheels have glass tube spokes and each contains a different colour. This method also facilitates a comparison of the various shades and ranges, but the device would be improved if the name of each colour were printed on the rim of the wheel at the end of each tube. Cadmium colours are prominent and bismuth chromate is a new product of very fast qualities.

Johnson, Matthey and Co., Ltd.

Johnson, Matthey and Co., Ltd., of 73-83, Hatton Garden, E.C.1, are melters and assayers to the Bank of England. They are manufacturers of precious and rare metal salts and ceramic products, sweep grinders and smelters, flatters and wire drawers of precious metals, and refiners.

Albright and Wilson, Ltd.

This Oldbury firm has two products of more than ordinary interest. One is acid calcium phosphate $Ca(H_2PO_4)_2$, which, it is claimed, creates an entirely new and hitherto unattained standard of purity. The only competition experienced with this product is the large quantities of the substance which are being dumped here from America. The firm is showing the product for the first time and claims that the detailed analysis available indicates its superiority. The figures given are these: $Ca(H_2PO_4)_2$, 83·3; equivalent to $Ca(H_2PO_4)_2H_2O$, 89·7; insoluble, 0·05; moisture, 0·35; $CaSO_4$, 0·17; bases, 0·12; inactive calcium phosphate, 9·4; lead, 5 parts per million; arsenic, ½ part per million.

The other product is pure silicon esters for preserving stone, according to Professor Laurie's process. Already new sections of Bristol University have been treated with the preparation as a preventive, but the chief use is expected to be as a remedy for worn stonework. The House of Commons is to be treated with it, and tests have shown that it will harden decaying sandstone in a week, even sufficiently to withstand chiselling. Silicon ester has not the disadvantage, common to many stone dressings, that it causes considerable damage when washed down on to other surfaces by rain.

The Malehurst Barytes Co., Ltd.

The Malehurst Barytes Co., Ltd, of Minsterley, Salop, are showing barytes, the natural sulphate of barium, which is found in veins usually associated with volcanic dykes in various parts of the world. Considerable deposits are found in Shropshire, Derbyshire, the Lake District, Germany, Spain, and Italy. After purification and grinding to a very fine powder the mineral is largely used as a filler for paints, etc., as it is practically inert chemically, and consequently undergoes no alteration in the acid atmosphere of towns. It also has the advantage of being entirely non-poisonous. Barytes also forms the raw material for the manufacture of the various compounds of barium. The ground material is usually packed in jute sacks or in casks.

Viscose Development Co., Ltd.

This company are the patentees and manufacturers of non-inflammable and odourless bag-shaped caps of cellulose (hydrate) which offer an hermetic closure and are spirit-tight and grease-proof. They can be applied in a few seconds without a machine. These caps are used extensively by such houses as Boots Pure Drug Co., May and Baker, the British Drug Houses, the B.D.C., and the United Alkali Co., Ltd.

Association of British Chemical Manufacturers

The Association of British Chemical Manufacturers, of 166, Piccadilly, W., occupies Stand A.2 and exhibits crystals of alum (Peter Spence and Sons, Ltd., Manchester); bichromates (J. and J. White, Ltd., Glasgow), and cyanides (British Cyanides Co., Ltd., London).

The Acme Chemical Co., Ltd.

The Acme Chemical Co., Ltd., Tonbridge, Kent, exhibits arsenate of soda, arsenate of lead powder (largely used in fruit orchards and cotton plantations) and the "Acme" powder spray. This is a fine powder applied with powder distributing or blowing machines, and is much less costly to apply than liquids.

Boots Pure Drug Co., Ltd.

Boots Pure Drug Co. make a comprehensive display of their products, and they intend this display to illustrate the rapidly expanding importance of their trade in fine chemicals, pharmaceutical and therapeutic substances. Special attention is given to a section devoted to research chemicals of guaranteed British manufacture and purity.

Other Exhibits

R. W. Phillips, Ltd., of Craven Street, W.C.2, are to display wide ranges of British soaps, and attention will be given to toilet and pharmaceutical lines by the Rambit Manufacturing Co., Regent Street; Samboy, and the Waverley Comb Co., Kingsland Road. The Otark Polish Co., Kingsland Road, will exhibit a wide range of polishes for specific purposes, including a preparation for keeping the windscreens of motors clear and free from rain spots.

The South Metropolitan Gas Co. have an arresting old-world inn stand complete with ancient board "At the Sign of the Benzene Ring." "Metro" disinfectant fluid is featured, and, of course, dry neutral sulphate in needle form. The Gas Light and Coke Co. also shows this product and demonstrates in simple form the by-products of gasified coal.

Birmingham Section

The British Industries Fair (Birmingham and Midland Section) at Castle Bromwich, Birmingham, was opened on Monday, when the Lord Mayor and prominent public men attended.

The display of varnishes, enamels and kindred products is extremely good. The Frederick Crane Chemical Co., Ltd., of Birmingham, show celluloid lacquers and varnishes, and spraying equipment; the Aerograph Co., Ltd., London, examples of wood preservative, and the "Atlas Ruskilla," paint for coating iron and steel; J. A. Shepherd and Co., Ltd., of Glasgow, enameloid paint; Mouldensite, Ltd., of Darley Vale, phenolic condensation products, including synthetic resins, etc.; and the Nobel Chemical Finishers, Ltd., Stowmarket, "Necol" cellulose lacquers and enamels. A. Holden and Sons, Ltd., Birmingham, show a good collection of varnishes, enamels, lacquers and paints; varnishes and woodstains, etc., by James Waddicon, Ltd., Bolton, and synthetic resin products by Birkby's, Liversedge, Yorks. The Hewitt Construction Syndicate Ltd., Westminster, feature anti-corrosive paints for iron and steel work; and liquid porcelain by the Collos Co., of Birmingham. Soap powders, etc., are well represented on the stand of Fitchetts, Ltd., Birmingham; lubricating and motor oils by the W. Blackwell Oil Co., Aston, Birmingham; and greases for high temperatures by Thomas Boorn and Co., Ltd., of London. W. Conway and Co., Ltd., Birmingham, show an apparatus for filtering and electrically heating solutions and a lacquer spraying apparatus. Paint-spraying plant is exhibited by the Midland Fan Co., Birmingham; and the Eclipse Spraying Co., of Smethwick, have sent an effective disinfecting sprayer. R. C. Knight and Dunford Smith, of Bishopsgate, London, show a conduit patent oil separator from water, the oil being recovered for further use.

The Lord Mayor of Birmingham (Alderman Bower), who is the patron of the Fair, was the chief speaker at the inaugural luncheon on Monday.

Nobel Chemical Finishes, Ltd.

Nobel Chemical Finishes, Ltd., is the new name of Necol Industrial Collodions, Ltd. Their products on view at Birmingham emphasise the continual development of the uses of cellulose lacquers and enamels in various industries, and none more than in the metal and allied trades. The "Necol" finishes are of high quality, and the uniformity which can be given in supplies manufactured at the Stowmarket works is of considerable importance to users. The "Necol" lacquers and enamels are quick, air-drying materials and designed especially for application by spray apparatus.

The chief features of the stand are:—"Necol" glossy opaque spraying enamels, which dry with a glossy finish and require no friction or polishing, and are supplied in all colours; "Necol" marbling enamels for metal, wood, and leather, producing a unique two-colour combination effect; "Necol" cellulose black enamels in matt, semi-matt, and glossy varieties; "Necol" cellulose wood finishes for application by spray; "Necol" colourless lacquers for dipping, brushing, and spraying; "Necol" bronze medium; "Necol" plastic wood for engineers, pattern makers, builders, cabinet makers, etc.

The Structure of Metals

A PAPER was read to the Chemical Society of the University of Birmingham, on Monday, February 8, by Mr. R. Robinson, B.Sc., on "The Structure of Crystals." The application of X-ray methods of analysis to the problems of crystal configuration as exemplified in the Bragg reflection method, was described, and the analysis of sylvine was discussed, together with the method of determining the wave length of a beam of X-rays. The lecturer also discussed the structures of diamond and graphite with reference to the problems of organic chemistry, and then gave a short résumé of the principles underlying the "powder method," quoting a few applications in illustration of this method.

Naphthalene as a Motor Fuel

To the Editor of THE CHEMICAL AGE.

SIR,—The article which appeared in this week's issue of your valuable paper, of which I am a regular reader, appertaining to naphthalene as a motor fuel was interesting, especially to those directly connected with the motor industry. Unfortunately, the progress of home-produced fuels has been greatly retarded, for the following reasons: not minimising the adjustments to existing carburetters, which have been adjusted and tuned up for petrol, dearth of internal combustion engine specialists and lack of publicity.

There are a vast number of motorists who are under the impression that to use any other fuel than petrol means the fitting of a special carburetter to suit. Many have experimented and been sadly disappointed because the adjustments have not been minimised to enable an engine to run on petrol or an equivalent fuel, existing carburetters have been altered, patent devices fitted; consequently the results have been obvious. I am of the opinion that it would be advantageous to the fuel concerns to inaugurate their own test department for the benefit of users of their particular fuels; there is little experimental work going on. Considering and surely owing to the heavy consumption of petrol of to-day and the likelihood of a vast increase, the time cannot be far distant before we shall have to produce our own fuels.

In the case of internal combustion marine type engines, other than the Diesel type, the fuel required, as laid down in the B.O.T. and Lloyd's rules, is paraffin, with a flashpoint not less than 73° Fahr. It is not intended by these rules to preclude the use of any other fuels which are suitable and possess equal safety. The flashpoint for the Diesel type must not be less than 150° Fahr. The writer, not knowing the specification of naphthalene, cannot comment on its suitabilities as a fuel for the latter, but would be interested to hear from any of your readers on the subject.

The Solex horizontal type carburetter has been found to be an excellent instrument for experimental purposes alone, owing to its simplicity and extreme accessibility. I prefer it to any other. It is adaptable to any internal combustion engine of standard construction, other than heavy oil types, and most fuels.—Yours, etc., REGINALD CADMAN.

25, Valence Wood Road, Becontree, Essex.
February 15.

Unemployment Among Chemists

To the Editor of THE CHEMICAL AGE.

SIR,—This Association has noted with interest that part of your editorial of February 6 which deals with the question of the supply of German chemists in excess of the demand, and since a similar state of affairs maintains in England, the matter seems to call for some comment.

The law of supply and demand can be applied no less to brains than to more material commodities, and where supply exceeds demand an exceedingly dangerous economic position will arise. In the material market the market must be expanded if it is not to perish, but in the case of the human market—if such a term may be allowed—this is not the only solution.

The Association is far from regarding registration as a panacea for all evils, but it has recognised for a long time that it would to some extent automatically regulate the supply of chemists, and thus assist in assuring a reasonable chance of success to those who earn their livelihood in the practice of chemistry.

A condition where supply exceeds demand is economically, socially, and politically unsound, and there is not a single argument that can be advanced in its favour. Cheap scientific labour is worse than useless, and the argument that it enables those who employ chemists to choose the best from a large field is fallacious. Where the possibilities of adequate remuneration are remote, and even the prospect of employment uncertain, good material will quickly cease to exist.

This is by no means the chief, nor the strongest, plea for a scheme of resgistration, but it is in itself sufficient to claim for it the immediate and careful consideration of all who have the good of the profession at heart.—I am etc.,

HY. T. F. RHODES, General Secretary.

British Association of Chemists,
175, Piccadilly, W.1.

Ammonia and its Compounds

To the Editor of THE CHEMICAL AGE.

SIR,—In the issue of January 9 of THE CHEMICAL AGE, to which our associate, the Solvay Process Co., subscribes, we were much impressed with the editorials on the production and utilisation of ammonia and its compounds.

We feel that these articles show a surprising grasp of the situation, and if it is consistent with your policy we would appreciate your telling us the name of the author of the editorials.—Yours, etc., C. G. TUFTS,

Manager, Department of Operations.
Atmospheric Nitrogen Corporation,
Syracuse, N.Y., February 4.

[We appreciate this complimentry reference and have supplied our correspondent with the information he desired.—ED. *C.A.*]

Judgment Against Liverpool Chemical Manufacturers

IN the King's Bench Division, Mr. Justice Roche, sitting in the Commercial Court, concluded the hearing (see THE CHEMICAL AGE, February 13) of the action by the Anglo-Celtic Shipping Co., Ltd., against Elliott and Jeffery, Cardiff, and Thompson and Co., of Liverpool, claiming damages for alleged negligence and breach of duty. It appeared that the work of repairing the ship was sent to the first defendants and it included the cleaning and repair of the condensers and for that purpose "Pluperfect" fluid was used, which was manufactured by the second defendants. That fluid had a peculiar property, unknown either to the plaintiffs or the first defendants, of giving off hydrogen if brought into contact with cast iron. A workman went to the spot carrying a lighted candle, and an explosion occurred, damage being done to the amount of £1,200.

Defendants denied liability, the second defendants alleging negligence against the plaintiffs in not giving the first defendants proper instructions by warning them that the condenser tubes were leaking; and they said that if there was danger in using the fluid, which they denied, the plaintiffs knew of the danger and elected to take the risk.

Expert chemical evidence was given to the effect that on analysis "Pluperfect" liquid was found to consist of a 10 per cent. solution of hydrochloric acid, with traces of other substances, and a small quantity of essence of citronella to give the fluid a distinctive smell.

His Lordship, in giving judgment, held that the first defendants were under no liability to the plaintiffs, and he gave judgment for the first defendants, with costs. It followed that the first defendants were entitled to be paid for the work in repairing damage done by the explosion, which was agreed at £1,200. As to the second defendants, he was of opinion that the fluid was an article which was dangerous. The warning given by the second defendants was quite inadequate. He found nothing to put anyone on the alert against the consequences of hydrogen and the risk of explosion. Judgment for the plaintiffs, with costs, for a sum to be agreed.

Papers to be Presented at Royal Society

THE Royal Society will meet on Thursday, February 25, at 4.30 p.m., when papers to be read will include:—"The Relativity Theory of Plane Waves and Electronic Orbits on the Relativity Theory," by O. R. Baldwin and G. B. Jeffery, communicated by Professor L. N. G. Filon; "The Motion of Two Spheres in a Viscous Fluid," by Margaret Stimson and G. B. Jeffery, communicated by Professor L. N. G. Filon; "Evidence for a Film Theory of Hydrogen Overpotential from Surface Tension Measurements," by A. L. McAulay and F. P. Bowden, communicated by Professor F. G. Donnan; Papers to be read in title only are:—"Critical Potentials of Hydrogen in the Presence of Catalytic Nickel and Copper," by J. H. Wolfenden, communicated by Professor E. F. Armstrong; "Adsorption Experiments with Radium D and Radium E," by J. P. McHutchison, communicated by Professor G. G. Henderson; "(1) High Temperature Oxidation of Metals, (2) The Low Temperature Oxidation of Copper," by J. S. Dunn, communicated by Dr. W. Rosenhain; "A Note on The Significance of the Electrode Potential," by J. Heyrovsky, communicated by Professor F. G. Donnan.

Chemical Trade Returns for January

Imports and Exports Down on Last Year: Exports Up on December Figures

IMPORTS of chemicals, dyes, drugs, and colours (excluding mercury) for January totalled £1,124,463, a decrease of £158,208 on last year's figures and a decrease of £189,589 on the previous month, December 1925. Exports are valued at £1,919,425, a decrease of £200,518 on last year, but an increase of £154,591 on December of last year.

On the import side, borax figures have more than doubled compared with last year, and so have red and orange lead quantities. Increases are also shown for unspecified coal tar products and tanning extracts. Potassium nitrate quantities are more than halved, and the figures for other potassium compounds have dropped very considerably. Sodium nitrate has dropped from 167,846 cwt. to 83,191 cwt.

On the export side the position of the sulphate of ammonia market is interesting. Japan's takings are still falling, and Italy, Spain and Dutch East Indies are taking less. France shows no imports, against 1,445 tons last year. Sulphuric acid figures have risen remarkably, also benzol and toluol, and naphtha rises from 2,413 galls. to no less than 18,363 galls. Crude glycerine has increased almost ten times, but the refined product is down. Ground barytes shows a marked increase.

It is noteworthy that while coal tar dye export quantities are up, the values are down, and this situation is also noticed particularly in the cases of naphthalene and caustic soda.

Imports

	Quantities. Month ended January 31.		Value. Month ended January 31.	
CHEMICAL MANUFACTURES AND PRODUCTS—	1925.	1926.	1925. £	1926. £
Acid, Acetic.....tons	696	553	32,314	26,758
,, Tartaric ....cwt.	3,289	3,048	16,114	14,770
Bleaching Materials ,,	9,184	7,992	10,070	5,755
Borax..... ,,	3,945	9,390	4,732	9,850
Calcium Carbide... ,,	89,180	88,147	60,605	57,433
Coal Tar Products, not elsewhere specified.....value	—	—	36,778	47,423
Glycerine, Crude ..cwt.	162	—	410	—
,, Distilled ,,	164	136	668	493
Red and Orange Lead..... ,,	2,174	4,759	4,755	9,522
Nickel Oxide..... ,,	20	—	122	—
Potassium Nitrate. ,,	10,472	4,358	11,493	4,865
Other Potassium Compounds .... ,,	559,743	275,001	94,756	77,986
Sodium Nitrate.... ,,	167,846	83,191	106,286	51,932
Other Sodium Compounds..... ,,	21,344	21,311	16,921	18,811
Tartar, Cream of.. ,,	6,394	5,096	23,102	18,155
Zinc Oxide.....tons	841	880	28,162	30,671
All other sorts....value	—	—	311,473	283,871
DYES AND DYESTUFFS—				
Intermediate Coal Tar Products ..... cwt.	8	174	155	1,283
Alizarine ..... ,,	5,286	174	22,505	7,484
Indigo, Synthetic . ,,	—	—	—	—
,, Natural ,,	24	—	820	—
Other Sorts ..... ,,	1,653	4,842	43,630	66,386
Cutch ..... ,,	6,040	7,476	9,285	12,351
Other dyeing extracts ,,	7,737	1,811	17,831	8,231
Extracts for Tanning ,,	89,802	125,121	86,454	115,222
PAINTERS' COLOURS AND MATERIALS— .				
Barytes, ground..cwt.	71,145	53,381	16,173	12,908
White Lead (dry).. ,,	14,601	11,351	31,203	23,254
All other sorts..... ,,	81,820	79,371	119,291	106,542
Mercury ..... lb.	81,051	81,648	13,579	15,042
Total of Chemicals, Drugs, Dyes, and Colours ..... value	—	—	1,296,250	1,139,505

Exports

	Quantities. Month ended January 31.		Value. Month ended January 31.	
CHEMICAL MANUFACTURES AND PRODUCTS—	1925.	1926.	1925. £	1926. £
Ammonium Sulphate—				
To France .....tons	1,445	—	18,716	—
Spain and Canaries.... ,,	9,756	5,505	127,924	70,927
Italy..... ,,	2,924	633	38,256	7,939
Dutch East Indies,,	7,329	5,943	98,622	76,476
Japan..... ,,	7,246	5,436	93,583	69,825
British West India Islands (including Bahamas) and British Guiana tons	291	445	3,984	5,765
Other Countries. ,,	3,443	4,824	46,056	59,573
Total ....tons	32,434	22,786	427,141	290,326
Acid, Sulphuric.....cwt.	3,137	12,440	3,253	6,444
,, Tartaric ..... ,,	1,131	1,154	6,061	6,410
Ammonium Chloride. tons	236	363	7,235	9,898
Bleaching Powder ...cwt.	31,474	28,559	15,442	13,931
COAL TAR PRODUCTS—				
Anthracene ..... cwt.	2,492	1,260	1,481	490
Benzol and Toluol. galls.	60,228	357,527	5,925	30,712
Carbolic Acid .....cwt.	10,441	13,862	21,698	20,487
Naphtha .....galls.	2,413	18,363	273	1,658
Naphthalene .....cwt.	2,180	4,724	1,913	1,741
Tar Oil, Creosote Oil, etc. .....galls.	3,668,407	4,648,484	99,785	141,388
Other sorts.....cwt.	41,866	32,790	21,799	19,071
Total ....value	—	—	152,874	215,547
Copper, Sulphate of ..tons	3,596	1,853	83,425	43,600
DISINFECTANTS, INSECTICIDES, ETC. cwt.	30,383	32,709	73,830	78,591
GLYCERINE—				
Crude ..... cwt.	66	6,099	177	18,312
Distilled..... ,,	26,484	16,138	98,130	64,577
Total .... ,,	26,550	22,237	98,307	82,889
Potassium Chromate and Bichromate ...cwt.	3,181	990	7,149	1,853
Nitrate..... ,, ...	860	2,221	1,820	2,461
All other Potassium Compounds .... ,,	1,336	1,534	9,972	12,459
Total .... ,,	5,377	3,745	18,941	16,773
Sodium Carbonate ..cwt.	562,698	391,488	127,799	117,307
Sodium Caustic..... ,,	147,528	151,267	110,087	106,127
Sodium Chromate and Bichromate ..... ,,	5,704	2,432	10,021	3,753
Sodium Sulphate .... ,,	57,371	45,219	8,969	5,738
All other Sodium Compounds..... ,,	46,885	41,897	72,580	47,906
Total .... ,,	820,186	632,303	329,456	280,891
ZINC OXIDE.....tons	90	255	3,496	8,556
Chemical Manufactures, etc., all other sorts, value	—	—	276,086	270,869
Total of Chemical Manufactures and Products (other than Drugs and Dyestuffs)..... value	—	—	1,495,547	1,324,774
DYES AND DYESTUFFS—				
Products of Coal Tar, cwt.	7,750	8,664	68,740	57,681
Other Sorts... .... ,,	3,314	3,598	4,835	5,814
Total .... ,,	11,064	12,262	73,575	63,495
PAINTERS' COLOURS, ETC.—				
Barytes, Ground ..cwt.	1,692	5,897	843	2,274
White Lead (dry).. ,,	11,565	4,174	30,138	10,179
Paints and Colours, ground ..... ,,	37,327	43,647	86,712	99,584
Paints and Enamels, Prepared ..... ,,	25,617	26,980	82,658	91,396
All other sorts..... ,,	47,707	44,351	93,458	89,146
Total .... ,,	123,908	125,049	293,809	292,579
Total of Chemicals, Drugs, Dyes and Colours .....value	—	—	2,119,943	1,919,425

Training of Industrial Chemists

Is It on the Right Lines?

THE training and organisation of industrial chemists was the subject of a paper by Dr. W. H. Gibson, of Belfast, at a meeting of the Manchester and District Section of the Institute of Chemistry on Thursday, February 11.

Dr. GIBSON said that chemists realised that a change was taking place in their position in relation to industry, but it was not easy to forecast the extent of the change and the implications consequent upon it. The flow of chemists from our colleges along well-worn channels into a well-defined group of industries known as the chemical industries, which formerly occurred, was no longer entirely the case. In response to external stimulus chemists were displaying increased activity and permeating unfamiliar industrial regions. This had led to a lag in the adaptation of our methods of training. The serious recognition of chemistry as a profession dated roughly from the foundation of the Institute of Chemistry in 1877, till when chemists were, in a sense, amateurs, not much concerned with the commercial effect of their activities, the industrial applications of which were, in general, not consciously sought, but just happened. Chemists were established at the outset in those industries which owed their origin to the progress of chemical discovery. In older industries the chemist was occasionally employed simply as a consultant. To-day the chemist was beginning to be regarded as necessary in all industries.

The Result of Changed Conditions

What manner of man ought the average industrial chemist to be; what were his duties in an industry not predominantly chemical; what training should he have; and how could his professional organisations assist him? The chemist's employer and his business colleagues ought to know how to dispose most usefully of his knowledge and activities. A chemist was of value in industry because he possessed a wide knowledge of the physical and chemical properties of substances, and of processes, and because he was a potential producer of any desired material. It was his duty to watch everything from the raw material to the finished article. From the industrial viewpoint, what were the defects in the chemist's training? As a result of the rise of chemical industries in the Victorian era and the increased number of those who wished to earn their living by a knowledge of chemistry, it ceased to be taught as a pure science and teachers in universities and elsewhere aimed at turning out analysts, consulting chemists, or supervisors of chemical industries. Thus a stereotyped system of training grew up which was fixed by the development of examinations for the university degrees in chemistry, which came to be recognised as a hall-mark. This stereotyped curriculum was now termed a training in pure chemistry, but he thought that such a training was not given anywhere at present.

The present university course turned out a type of industrial chemist more suited to primitive Victorian conditions than to those of to-day. Recently chemists had specialised either in particular branches or in training for a particular industry, but the best product was obtained by first making a good general practitioner and then turning him into a specialist. Students must receive before everything a training in pure chemistry, the latter being rigidly defined. A revised course of pure chemistry would turn out a better trained man in a shorter time. A chemist intending to enter industry ought to acquire a foundation of pure chemistry, and then take a course of applied chemistry. Overdosing the chemist with information was not the way to foster enthusiasm. Character, judgment, and discrimination were required in industrial chemistry. Instruction in general applied chemistry, not necessarily a course of chemical engineering, should precede specialisation in any particular industry. An intelligent understanding of engineering principles was quite sufficient.

Applied chemistry, to his mind, was still chemistry, but with special reference to chemical and physical properties in relation to value and to the influence of such factors as bulk, time, and cost. It included such things as the art of construction and use of specifications, analytical control of materials and processes, the stepping-up of processes from the laboratory to the works scale, sampling, etc. Such things could very well be introduced to the student in a course of general applied chemistry. Sufficient attention had not yet been paid to the development of what might be termed laboratory forecasting of large scale operations. For instructional purposes well-established manufacturing processes would be chosen and the forecasts obtained in the laboratory could be verified. Costing had not yet reached its fullest development. It would not be a simple matter to devise a satisfactory course of instruction in general applied chemistry, but it could be done.

Technology of Specific Materials

Time could well be spent on the technology of materials with which a chemist had much to do in all industries, such as fuels, water, lubricating oils, the uses of the commoner metals and alloys, paints and building materials. Practical work was too stereotyped in laboratory training. In industrial work ordinary analytical methods were frequently unsuitable. Students must know how to look for traces of impurities, how to use micro-analytical methods, and all kinds of instruments for measuring physical properties. In commercial laboratories resource and adaptability had to be combined with speed and accuracy. As subsidiary subjects students of industrial chemistry might take up mathematics and physics. A knowledge of engineering did no harm, but they should not ally themselves too closely to the engineer in industry. The engineer was not concerned with policy in the way that departmental managers were and as the chemist should be. The training should include business methods, economics, and statistics.

Mr. C. H. MANLEY said that, according to his experience in Oxford, most men trained in chemistry had looked to universities and schools for their livelihood, and only during the war did the industrial value of the chemist begin to receive proper appreciation and reward. They ought to drop the title "chemist" and adopt some such one as "chemiologist."

Mr. L. GUY RADCLIFFE said the chemical training given in our universities should be as pure as possible, and in university training it was pure chemistry that was being taught. In Manchester the University proper largely preserved the teaching of, and the granting of, university degrees in pure chemistry, while, in response to industrial demand, the College of Technology had superimposed a technical type of chemistry upon the training in pure chemistry. They had made a speciality of the chemistry of bleaching, dyeing, and finishing, and had also produced a metallurgically trained chemist. During the last year or two the University had created a higher course degree which necessitated further study, largely of a general technical chemical course. They wanted to include such subjects as lubricants, oils and fats, ceramics, and fuels.

Inadequate Knowledge of Costings

Mr. F. SCHOLEFIELD said that in industry science did not matter twopence to anybody except in so far as it enabled a particular firm to show a better balance sheet at the end of the year. A young chemist going into industry could not claim anything like the salary which his attainments might secure for him in academic research. Employers could not pay these young men £200 or £250 a year to start with; they were not worth it to the industry. The ideas of costing of many would-be industrial chemists on going into a works were deplorable.

Mr. W. A. SILVESTER said that the bias of university teaching was very much in favour of theoretical chemistry.

Mr. J. GREENWOOD said that twenty-five per cent. of the technical chemists in Manchester and district, both in the chemical and non-chemical industries, had not received their training in universities.

Mr. MILLS expressed the view that industrial employers expected too much from a young chemist who entered a works straight from the university. Employers should be prepared to train pure chemists in their own industry.

Mr. BARRETT urged that the chemist should be given some business training.

Dr. GIBSON having replied to some of the points raised, a vote of thanks was moved by Mr. Radcliffe, seconded by Mr. D. M. Paul, and carried with enthusiasm.

Problems of Colour Measurement

The Need for Standardisation

AT the meeting of the Oil and Colour Chemists' Association in London on Thursday, February 11, Dr. L. C. Martin read a paper on "Colour Measurement."

People, said Dr. Martin, had rather taken it for granted that colour was a thing which could be measured by already existing standards. Was that so, or must we start afresh and define and fix new standards? He thought the latter would prove to be the case. The most recent measurement of colour was the reproduction of stimulus resulting from the illumination of a coloured surface by white light, and it would be found that apparent colour varied considerably with the quality and mode of illumination. What he wished to call attention to was that it was most important to specify how the coloured body should be illuminated. There must be some standard means of illumination. His own suggestion—and he had first made it in 1922—was that the illumination should be, practically speaking, by a parallel beam of white light incident at an angle of 45 degrees to the normal, and that the surface should be viewed from the normal direction, i.e., the point of view should be at right angles to the surface. Although he was not aware of it, when the Eastman colorimeter came over here later, he found it was arranged in just that manner. The National Physical Laboratory had adopted this as the standard method of illumination, and he believed the method would come into general use. At present it was not quite common because in the United States they had other views.

Standardising the Illumination

There were some materials which changed their colour considerably according to the type of illumination. The so-called sensitive tint cloths changed their colours violently when transferred from artificial light to daylight. Burning some specific substance under specific conditions had been largely abandoned owing to difficulties in making corrections for atmospheric pressure and variations of humidity. Considerable work had been done with arc lamps, incandescent lamps, vacuum lamps, gas-filled lamps and tungsten arcs, all of which require correcting by some standard colour filter if approximated daylight is being aimed at. Another source of illumination was the Moore vacuum tube in which the discharge took place in rarefied CO_2.

For an ideal standard it was necessary that the photometric intensity should be constant and the distribution of the energy in the spectrum must be constant and, moreover, it should conform to the energy distribution characteristic of average daylight. The stringency with which these conditions must be fulfilled would be considerably relieved if the same source could be used for illuminating the sample as was used in the colorimeter. No system adapted for daylight would give the same results if a change were made to artificial light. There was, however, a possibility of establishing an arbitrary standard of white light by taking an incandescent vacuum lamp as a primary source—because this would keep reasonably constant and gas-filled lamps were not so easy to keep constant—and running it under specified conditions and correcting the relative distribution of energy in the spectrum by filtering the light through some standard solution, made up of, say, cobalt salt and copper salt in solution in specified quantities. This might give equivalent results to daylight on practically any coloured object that was submitted to it. At the N.P.L. they had been working out solutions of that kind and there seemed every possibility that the time was practically ripe for defining an arbitrary standard.

Once we had the white light standard, then the equivalent colour temperature would be a most valuable piece of information. In actual practice, probably the laboratory standard would be the gas-filled lamp with a filter, but it would be necessary to have, as a standard, a vacuum lamp with a colour filter suitable to it, with which could be compared, from time to time, the gas-filled source of light for colour measurement. In that way we should be certain of getting the right colour in the illumination.

With regard to the actual measurement of colour, several satisfactory colorimeters, using colour filters, had already been devised, but the point was how these lent themselves to exact standardisation. The production and maintenance of accurately standardised filters, especially gelatine filters, would be difficult. It was not easy to make a colour filter to order having definite properties. The problem was to produce colour filters which could be rigorously and more or less arbitrarily standardised in manufacture so that they would be within the ordinary limits of human observation. If we could arrive at a state where we fixed our standards and then only had to use one visual colour match in order to secure a colour measurement, we should be in a much happier position.

Dr. H. H. Morgan's Comments

THE PRESIDENT (Dr. H. Houlston Morgan), in thanking Dr. Martin for his paper, said that the whole subject of colour measurement bristled with difficulties, and his impression was that we had not yet got down to bed-rock facts. People confused colour sensation with colour stimulus, and very often writers on the subject were not agreed upon the definition of the terms they used. Therefore Dr. Martin had done a useful service in taking his audience back to the fundamental elementary scientific principles—so far as they were known—underlying the subject.

Mrs. LOVIBOND said that as the tintometer had its co-relation to the wave-lengths of the spectrum and also to the chemical solutions which had been found to be constant, it should really stand a good chance of being some day adopted as the legal unit for colour.

Mr. NOEL HEATON pointed out a great necessity for getting some workshop method for obtaining critical measurements of the same colour. In comparing barytes none of the forms of apparatus available enabled them to get anything approximating to a solution of that particular problem. The differences in whites obtained from barytes were very considerable, and it would be a very great practical advantage to have some apparatus which would enable them to define the exact differences.

Dr. MARTIN briefly replied, and said that the measurement of white had been one of the most difficult problems for a long time, and he had some idea of how it might be possible to devise a satisfactory white meter or tint measurer. The advantage of using photo-electric cells for colour standardisation, in a limited sense, was that the relative response of the cells to radiations of different wave-length was very different for sodium and rubidium.

Petroleum Technologists' Medals and Scholarships

THE Institution of Petroleum Technologists has awarded the Boverton Redwood Medal for sessions 1923-24 and 1924-25 to Mr. C. H. McCarthy-Jones, M.I.Mech.E., M.I.E.E., M.Inst.P.T., for his paper entitled "Electricity Applied to the Winning of Crude Petroleum, with Special Reference to the Yenangyaung Field, Burma." The Students' Medal and Prize for 1925 has been awarded to Mr. Ernest Clark (Student of the Petroleum Technology Course, Royal School of Mines, Imperial College of Science and Technology), for his paper entitled "Organic Theories of Oil Origin," and it is hoped that Mr. Clark will be able to read this paper at the General Meeting of the Institution, to be held at the House of the Royal Society of Arts on May 11. The Institution's Scholarships for 1925 have been awarded as follows:—Royal School of Mines, Imperial College of Science and Technology, London, Mr. J. O. Tanner; University of Birmingham, Mr. C. J. Ward.

United Alkali Co. Boiler Explosion Report

THE report has been published of the Preliminary Inquiry under the Boiler Explosions Act of the explosion from a water-tube boiler at the works of the United Alkali Co., Ltd., Fleetwood, on April 1, 1925. The cause was found to be the overheating of the tube so that it weakened and was unable to withstand the steam pressure which, at the time, was 110 lb. per sq. in. Severe external tube wastage over the tube front in way of the fire was also a contributory cause. "It is felt, however," says the report, "that the principle of massed fire, with insufficient combustion space or of other means for neutralising the volatile elements of the fire, with the consequent direct flame action on the tubes, is not consistent with good practice." The report, including full diagrams and photographs, is published by H.M. Stationery Office (No. 2728).

Developments in Vat Dyes

Progress in British Production

THE fifth of the series of lectures arranged by the Dyers Company in London was delivered on Monday evening by Mr. R. Fraser Thomson (of Scottish Dyes, Ltd.), who dealt with the question of vat dyes and some recent developments.

Dealing with the evolution of the manufacture of vat dyes in this country, Mr. Thomson said that the task of making them was almost universally considered to be impossible at the outbreak of war, and dyers in particular were very apt to sneer at the attempts then being made to reproduce vat colours for use in the dyeing of guaranteed fabrics. Time, however, had shown that those sneers were not justified. Within three months of the outbreak of war the first batch of colour required to produce the material originally imported from Germany was actually used in the dye house. Within about four years all the available space at the company's works at Carlisle had been utilised for buildings given over to the manufacture of the dyes, and subsequently new works were erected at Grangemouth, in Scotland.

New Dyes

Several new dyes of high importance had been discovered by the company, the chief one being Caledon Jade Green. It was important not only because green dyestuffs were comparatively rare, but also because it was the first green of its kind that was absolutely fast, not only to light and washing, but to bleaching. As the subject of the constitution of this colour had not been discussed in public before, he took the opportunity of throwing a little light on it. Caledon Jade Green was an anthraquinone derivative. Vat dyestuffs, generally speaking, were anthraquinone derivatives, and the manufacture of these had in the past been carried out almost exclusively from anthracene as the raw material. Scottish Dyes, Ltd., however, owned the rights of a catalytic process for the production of phthalic anhydride from naphthalene by the action of air in the presence of a catalyst, and, owing to the favourable price conditions, it was more profitable to manufacture anthraquinone derivatives from this body than from anthracene. The simplest type of such a conversion was the production of anthraquinone by condensing phthalic anhydride with benzene in the presence of aluminium chloride. This gave ortho-benzoyl-benzoic acid, which readily lost water by the action, for instance, of sulphuric acid, to form anthraquinone.

Properties of Benzanthrone

Dealing with the chemistry of the subject, he said that the chemistry of benzanthrone hinged on the properties of the benzene ring, which had attached itself to the anthraquinone molecule, and in many respects benzanthrone might be regarded as the substituted benzene. Thus, the reactivity of the molecule was entirely due to the benzene ring. The positions 13, 12 and 11 were the most reactive, in that order. When benzanthrone was condensed by means of alkali, a junction of two molecules occurred, the 13 position of one molecule attaching itself to the 2 position of a second molecule, and *vice versa*. In this molecule the two most reactive positions were the 12 positions of the original benzanthrone molecule. Thus, upon oxidation of this new molecule the oxy groups were inserted in the two 12 positions. This product, a di-hydroxy di-benzanthrone, was remarkably reactive. The hydroxy groups condensed with alkalating agents of almost any type, such as alkyl halides, and in particular gave very easily the di-methoxy derivative by the action of methylating agents.

The hydroxy body also gave acyl derivatives, in particular the acetyl compound. A sample of this body was shown, and the colouring power of the molecule was exhibited by the fact that the acetyl compound was hydrolysed to the free oxy body by means of sodium hydrosulphide, and the leuco compound thus obtained dyed cotton blue, the blue colour being due to the sodium salt of the leuco compound. On suddenly acidifying the dyed material while still reduced, it was turned pink, which was the colour of the free leuco compound. On transferring the pink hank of material back to the sodium hydrosulphide, or to an alkaline bath, the blue colour was restored, and the hank, on squeezing, oxidised to a yellowish green, and this yellowish green represented the sodium salt of the di-hydroxy di-benzanthrone, so that, on acidifying, the free di-oxy di-benzanthrone was obtained as a blue colouring matter. The shade of di-methoxy di-benzanthrone lay midway between that of the sodium salt and the free hydroxy body.

Thirty or more other alkyl derivatives had been prepared, and well defined rules could be laid down for the shade of such derivatives. They fell into several classes, chiefly closed chain ethers and open chain ethers.

Amongst the closed chain ethers some remarkable compounds had been obtained, such as those obtained by condensing di-chlor-acetone with di-hydroxy di-benzanthrone. These apparently contained a closed side chain of nine members. The shade of this body was blue. Another interesting derivative was the body obtained by condensing di-chlor di-phenol methane with di-hydroxy di-benzanthrone. A dyeing of this substance was shown, of an indigo blue colour, but it was pointed out that it was not fast to light, owing to the weight of the two phenol groups, and, generally speaking, supreme fastness was only obtained with such alkyl derivatives as had the minimum weight in the side chain. The open chain ethers consisted of the methyl, ethyl, etc., derivatives, and various alkyl derivatives, such as those obtained by condensing epichlorhydrin with di-oxy di-benzanthrone. Such ethers became progressively bluer in shade as the side chain increased in weight.

Caledon Jade Green, which was intermediate in shade between the yellowish green of the sodium salt and the blue colour of the free hydroxy body, was quite unaffected by acids and alkalis. The I.G., the important colour trust in Germany, had adopted the colour as being the standard fast colour. Caledon Jade Green also had the remarkable property of accommodating itself to any class of dyeing.

A sample of phthalic anhydride produced by Scottish Dyes, Ltd., was exhibited. When first produced it was found that the melting point was $3\frac{1}{2}$ degrees higher than anything that had been mentioned in the literature up to that time, and it was pretty well accepted that its purity was of the order of 99·9.

Chemical Matters in Parliament

Poison Gas—Public Protection

The Prime Minister (House of Commons, February 10), in reply to Mr. C. Wilson, said that measures to this end were still under consideration, but it was not in the public interest to say anything more specific.

Sugar Beet Industry

Mr. Guinness (House of Commons, February 11), in reply to Mr. Livingstone, said that the gross amount of subsidy paid under the British Sugar (Subsidy) Act during the financial year 1924–25 was £492,040 4s. 7d. The gross amount paid during the current financial year up to February 6 is £907,570 1s. 3d., making a total gross subsidy paid to the date stated of £1,399,610 5s. 10d.

Mr. Guinness (House of Commons, February 15) said that new factories for the 1926 crops would be ready at Spalding, Peterborough, Poppleton (near York), Felstead, Earlstown, Cupar, and possibly at Bardney, Lincs, and Frimley, Surrey.

There was a lengthy debate in the House on sugar beet on the question of subsidy grants.

Mr. R. McNeill (House of Commons, February 16) said that he had no details of total capital invested in the industry. Guarantees under the Trade Facilities Acts were as follows :—Anglo-Scottish Beet Sugar Corporation, Ltd., £370,000; Second Anglo-Scottish Beet Sugar Corporation, Ltd., £865,000; West Midland Sugar Co., Ltd., £150,000; Orchard Sugar Co., Ltd., £80,000; Central Sugar Co., Ltd., £185,000; Lincolnshire Beet Sugar Co., Ltd., £225,000; total, £1,875,000. The total amount of the loans already taken up was £1,035,000.

Dr. G. C. Clayton's Bill

In the House of Commons on Friday, February 12, Dr. G. C. Clayton's Re-election of Ministers Bill was supported by the Prime Minister, was read a second time, and was committed to a standing committee. It is intended to obviate the necessity of a member having to stand for re-election on appointment as a Minister of the Crown.

Lead Paints Protection and Petroleum Bills

Sir W. Joynson-Hicks (House of Commons, February 16) said that he hoped to introduce the Lead Paint Protection Bill very shortly, and the Petroleum Bill this year.

From Week to Week

GIFTS AMOUNTING TO OVER £800 to local charities were voted by the board of the Bradford Dyers' Association, Ltd., on Monday.

THE ONLY FUELS ALLOWABLE in the Tourist Trophy Races will be, the Auto-Cycle Union has decided, No. 1 grade petrol and benzole, but these may be mixed.

TO ESTABLISH A PHYSICO-CHEMICAL INSTITUTE at Madrid, to serve as central laboratories for Spanish scientific workers, the Rockefeller Foundation has made a gift of $200,000.

THE WOOD DISTILLATION plant of the Hajnowka concern at Bralowischer Urwald, Poland, is to close down indefinitely owing to financial difficulties. This plant is one of the largest in Europe.

A GOLD MEDAL is to be awarded annually by the College of Pestology in memory of the late Professor H. Maxwell Lefroy, who was fatally gassed when experimenting with an insecticide last year.

THE WEDDING TOOK PLACE at Foulridge on Friday, February 12, between Mr. M. H. Stothert, of Stotherts, Ltd., manufacturing chemists, Atherton, Manchester, and Miss K. Holt, only daughter of Mr. and Mrs. T. Holt, of Foulridge.

BY A PROVISIONAL FRANCO-GERMAN AGREEMENT, signed last week, Germany will secure the minimum tariff or percentage of reduction falling between two French tariffs on certain classes of chemical products. Details are not yet available, but the provisional agreement is for three months.

DR. C. D. ELLIS WILL BEGIN A COURSE of three lectures on Friday, February 26, 5.15 p.m., at the Royal Institution on the atom of light and the atom of electricity, and on Saturday, March 6, at three o'clock Sir Ernest Rutherford commences a course of four lectures on the rare gases of the atmosphere.

A FURTHER TRIENNIAL SCHOLARSHIP, value £300, to commence in 1927, has now been offered by a well-known firm of reinforced concrete engineers, and accepted by the Council of the Institution of Structural Engineers, Abbey House, S.W.1. Particulars regarding these scholarships may be obtained from the Secretary.

TO ASSIST MANUFACTURERS of soaps, paints and varnishes, an exhibition of foreign samples was held at Manchester on Friday in connection with the Department of Overseas Trade. The products of all important competing countries were exhibited and prices were given. A similar exhibition was held at Liverpool on Wednesday and Thursday.

DR. J. NEWTON FRIEND, head of the chemical department of Birmingham Municipal Technical School, is giving a series of lectures on historical chemistry at that school. The Society of Chemical Industry of Birmingham and the Midlands is closely allied with the undertaking, and many members attended on Friday, February 12, when Dr. Newton Friend spoke on "Joseph Priestley" who spent a large part of his life in Birmingham.

NEW REGULATIONS for the use of lead by vehicle painters have been issued by the Home Office. No lead paint shall be sprayed except in a special compartment with an efficient exhaust, lead paint must not be rubbed down or scraped by a dry process, and there are regulations concerning sanitary arrangements. Objections can be lodged with the Home Secretary within 21 days from February 15. The employers' and workers' organisations have accepted the regulations.

AN IMPORTANT ARRANGEMENT is announced by the Central Mining and Investment Corporation, Ltd., in the form of a contract for a period of years with the Mond Nickel Co., Ltd. The latter concern will refine at their precious metal refinery, London, all the production of the Onverwacht property. The first shipment will arrive here in a few weeks and will be treated immediately. Marketing arrangements have been made for the disposal of the output of the refined platinum and allied metals.

"POLLOPAS," the synthetic "glass" manufactured by Dr. Fritz Pollak, of Vienna, is the subject of revived interest, and reports state that a factory may be started in Manchester. No less than some 15 months ago THE CHEMICAL AGE described this product, and in the issue of June 20, 1924, its main constituents were recorded. They were urea (CH_4N_2O) and formaldehyde. A very similar product, a synthetic resin, was exhibited by British Cyanides at Wembley last year, and its commercial applications are being handled by the subsidiary concern, The Beetle Products Co.

SPEAKING AT THE NORWICH ROTARY CLUB last week, Mr. J. de Carle Smith pleaded for research on definite industrial problems. There was need, he said, for a cheap rustless steel, and research was needed to achieve the economic production of alcohol from green vegetation. This could already be done, but at an uneconomical price. He pleaded for closer co-operation between manufacturer and chemist and for the former to appreciate and praise the latter's work. It was public recognition and manufacturers' appreciation that gained for the German chemists the great reputation and prosperity which they enjoyed before the war. British chemists, the speaker maintained, always had been as great as, if not greater than, German chemists.

SIR ALFRED MOND has now been officially requested to resign his Carmarthen Parliamentary seat, following his secession from the Liberal Party.

DR. KARL DUISBERG, director of the new German Dye Cartes, recently visited the United States and proceeded from there to the West Indies, China, and Japan.

MR. H. C. CRAWSHAW, of Wormalds and Walker, Ltd., Dewsbury, has been appointed a member of the Dyestuffs Advisory Licensing Committee in place of Mr. A. Wadsworth, resigned.

THE ANNUAL DINNER of the Oil and Colour Chemists' Association will be held on March 3 at 7.30 p.m. at the Grand Hotel, London, W.C.2. The date has been changed from February 19.

MR. A. B. CRAVEN, manager of the Selby works of the Yorkshire Dyeware and Chemical Co., Ltd., was on Friday, February 12, installed as Worshipful Master of the Selby St. Germains Lodge of Freemasons.

LLANELLY COPPER WORKS, established over 100 years, is to close down. Before German and American competition curtailed activities, thousands of tons of copper and lead and 2,000,000 ounces of silver were refined annually.

A COMMITTEE TO SURVEY THE FUEL RESOURCES of Nottingham and Derbyshire has been appointed by the Department of Scientific and Industrial Research. Dr. C. H. Lander, Director of Fuel Research, and Mr. F. S. Sinnatt, Superintendent of the Physical and Chemical Survey of the National Coal Resources, are ex-officio members.

RECENT WILLS INCLUDE—Mr. Charles Washington Townsend, Kelvinside, Glasgow, retired chemical manufacturer, £30,266.—Mr. W. N. Cheesman, president of the Mycological Society, £10,721.—Mr. Harry Murgatroyd, Bradford, dyer, of Perseverance Dyeworks, Shipley, £6,555.—Mr. Harry Clayton, of Warrington, director of Joseph Crosfield and Sons, Ltd., and of the Erasmic Co., Ltd., £11,306 (net personalty £10,424).

IN ADDITION to the new B.D.C. colours mentioned in our last issue, the Corporation announce an addition to their range of insoluble pigment colours—Monolite Red C paste. It is described as of special interest to printing ink lake manufacturers, on account of its full, fiery red shade, which possesses good body and a fine bronze overtone. Where a high standard of fastness to light is not essential, it is suggested for paints fast to lime and for wallpapers.

TREASURY GUARANTEES under the Trade Facilities Act, announced on Wednesday, include Pearson and Dorman Long, Ltd., £2,000,000 to develop Kentish coalfields; Central Sugar Co., Ltd., £185,000, for sugar beet factory at Peterborough; Appleby Iron Co., Ltd., £650,000, for additional plant and machinery; Raysheen, Ltd., £85,000, for machinery for artificial silk factory at Lisnafillan; Nitrate Producers' Steamship Co., Ltd., £180,000 for the construction of two ships at Sunderland.

BIRMINGHAM'S CITY ANALYST, Mr. J. F. Liverseege, in his latest report, states that four samples of apples were examined for arsenic, and in one sample one-hundredth of a grain per pound was present on the skin. Of the 12 samples of aspirin tablets, five were free from talc and seven contained from 0·9 per cent. to 4·5 per cent. The B.P.C. ordered 2 per cent. of purified talc in the preparation of these tablets. The tablets of one sample, after soaking in water for three days, showed no difference in appearance, and another sample was very slow in breaking down. Seven of the 12 samples of sodium citrate contained from 1 per cent. to 3·8 per cent. of talc. It would seem better that an insoluble substance like talc should be absent.

ERNEST EDWARD MUNRO PAYNE, 57, of Red House, Narborough, applied for his discharge in bankruptcy at Leicester County Court on Thursday, February 11. An analyst, Payne was described as a scientific genius, but unmethodical in regard to personal affairs. The judge had satisfied himself of the great national importance of the work done by Payne who had developed certain secret processes. On numerous occasions Payne had been called in as an expert in intensive legislation, and he was regarded as an outstanding expert in the tanning trade. His employers had absolute faith in his integrity and regarded him as a genius. Subject to payment in full of the costs and preferential debts, and 10s. in the £ to the unsecured creditors, the discharge was granted, to be suspended till this was done.

Obituary

DR. L. TIETJENS, for 40 years director of the laboratory of the German Potash Syndicate.

MR. ROBERT B. MITCHELL at Troon, on February 12, director of Mirrlees, Watson and Co., Ltd., manufacturers of sugar, and water distilling and condensing plant, Glasgow.

MR. DAVID SING CAPPER, on Friday, February 12, at Golders Green, aged 61. He was for nearly 20 years Professor of Engineering at King's College, of which he was a Fellow. He was a member of the Senate of London University, and a governor of the Imperial College of Science and Technology.

References to Current Literature

British

COAL.—Coal ash and clean coal. R. Lessing. *J. Roy. Soc. Arts*; Part I., January 15, 1926, pp. 182–197; Part II., January 22, 1926, pp. 205–218; Part III., January 29, 1926, pp. 224–241.

CORROSION.—Porosity and intensive corrosion. Experiments on commercial sheet zinc and other materials. U. R. Evans. *J.S.C.I.*, February 12, 1926, pp. 37–44T.

DYEING.—The dyeing of natural silk hose containing cotton. H. D. Mudford. *J. Soc. Dyers and Col.*, February, 1926, pp. 44–46.

The application of nitrobenzyl-cellulose ethers to the dyeing of cotton. D. H. Peacock. *J. Soc. Dyers and Col.*, February, 1926, p. 53.

DYESTUFFS.—Recent researches on mordant dyes. G. T. Morgan. *J. Soc. Dyers and Col.*, February, 1926, pp. 54–58.

FUEL.—Investigation of the composition of cracked spirit. H. Moore and R. B. Hobson. *J. Inst. Petroleum Tech.*, December, 1925, pp. 587–592.

The action of sulphuric acid on cracked spirit. C. M. Houghton and S. Bowman. *J. Inst. Petroleum Tech.*, December, 1925, pp. 583–586.

HALOGEN COMPOUNDS.—Chloro derivatives of *m*-hydroxybenzaldehyde. H. H. Hodgson and H. E. Beard. *Chem. Soc. Trans.*, January, 1926, pp. 147–155.

Preparation, hydrolysis, and reduction of the fluoro-, chloro- and bromo-benzyl bromides. J. B. Shoesmith and R. H. Slater. *Chem. Soc. Trans.*, January, 1926, pp. 214–222.

KETONES.—Some derivatives of 1 : 1'-bismenthone. P. G. Carter and J. Read. *J.S.C.I.*, February 12, 1926, pp. 44–46T.

LAKES.—A general survey of the coal-tar colour lake industry. H. Jackson. *J. Oil and Colour Chem. Assoc.*, January, 1926, pp. 5–17.

LEATHER.—The behaviour of sharpened limes in unhairing. M. Kaye and R. H. Marriott. *J. Soc. Leather Trades' Chem.*, December, 1925, pp. 591–620.

OILS.—The hydrogenation and desulphurisation of Norfolk shale oil. H. G. Shatwell. *J. Inst. Petroleum Tech.*, December, 1925, pp. 548–555.

The valuation of motor spirit and lubricating oils. H. Moore. *J. Inst. Petroleum Tech.*, December, 1925, pp. 571–575.

ORGANO-METALLIC COMPOUNDS.—Cyclic organo-metallic compounds. Part I. Compounds of tellurium. H. D. K. Drew. *Chem. Soc. Trans.*, January, 1926, pp. 223–231.

PAINTS.—Some chemical and physical characteristics of paint. Part I. A. K. Light. *J.S.C.I.*, February 12, 1926, pp. 101–103.

TEXTILE TREATMENTS.—Comparison of the effect of oxidation before and after the mercerisation of the cotton fibre. E. Knecht and E. F. Muller. *J. Soc. Dyers and Col.*, February, 1926, pp. 46–53.

VITAMINS.—Studies on the chemical nature of vitamin A. J. C. Drummond, H. T. Channon and K. H. Coward. *Biochem. J.*, No. 6, 1925, pp. 1047–1067.

Colour reactions associated with vitamin A. W. R. Fearon. *Biochem. J.*, No. 6, 1925, pp. 888–895.

German

ACIDS.—The separation of the liquid linoleic acids by fractional solution of their zinc salts in alcohol. C. Agde. *J. prakt. Chem.*, January, 1926, pp. 37–56.

ANALYSIS.—The quantitative estimation of rubidium and caesium. W. Strecker and F. O. Diaz. *Z. anal. Chem.*, No. 9, 1925, pp. 321–341.

The separation of iron and aluminium from zirconium. R. Lessing. *Z. anal. Chem.*, No. 9, 1925, pp. 341–352.

CARBON.—Active carbon. Part V. The conditions of activation. O. Ruff and H. Backe. *Kolloid-Z.*, January, 1926, pp. 59–73.

CATALYSIS.—The catalytic phenomena of the solution of zinc in acids. M. Centnerszwer and M. Straumanis. *Z. physikal Chem.*, December 30, 1925, pp. 415–446.

COMPLEX COMPOUNDS.—Compounds of molybdic and tungstic acids, as well as pentavalent molybdenum, with polyphenols and phenol acids. R. Weinland and A. Babel. *Z. anorg. u. allg. Chem.*, January 14, 1926, pp. 177–209.

Compounds of pyrocatechol and pyrogallol with stannic acid. R. Weinland and M. Maier. *Z. anorg. u. allg. Chem.* January 14, 1926, pp. 217–230.

Some bismuthamines and bismuth complex compounds. A. C. Vournazos. *Z. anorg. u. allg. Chem.*, January 14, 1926, pp. 147–156.

FILTRATION.—The mechanism of ultrafiltration. J. Duclaux and J. Ererra. *Kolloid-Z.*, January, 1926, pp. 54–57.

Modern membrane filtration. Part I. W. Overbeck. *Chem. Apparatur*, January, 25, 1926, pp. 14–16.

GLUCOSIDES.—Compounds of aldoses with urea and their application to the synthesis of nitrogen-containing glucosides. B. Helferich and W. Kosche. *Ber.*, January 13, 1926, pp. 69–79.

HAFNIUM.—A separation of hafnium and zirconium by fractional precipitation as phosphate from oxalic acid solution. J. H. de Boer. *Z. anorg. u. allg. Chem.*, January 14, 1926, pp. 210–216.

OILS.—Investigation of a Bergin oil from Lower Silesian coal dust. M. Heyn and M. Dunkel. *Brennstoff-Chem.*, January 15, 1926, pp. 20–25.

The light oils of low-temperature tar. A. Klein. *Brennstoff-Chem.*, January 1, 1926, pp. 3–7.

REACTIONS.—The reversible exchange of the oxidation stages between aldehydes or ketones on the one hand and primary or secondary alcohols on the other. W. Ponndorf. *Z. angew. Chem.*, February 4, 1926, pp. 138–143.

Equilibria between metals and salts in the fused state and a new form of mass action law. R. Lorenz. *Z. angew. Chem.*, January 28, 1926, pp. 88–90.

The addition of sulphite to unsaturated compounds. E. Hägglund and A. Ringbom. *Z. anorg. u. allg. Chem.*, January 14, 1926, pp. 231–253.

The decomposition of humic acids at 100°. W. Eller and A. Schöppach. *Brennstoff-Chem.*, January 15, 1926, pp. 17–20.

REDUCTION.—The reduction of cresols. G. Stadnikoff, N. Gawriloff and A. Winogradoff. *Brennstoff-Chem.*, January 1, 1926, pp. 7–9.

The reducibility of cresols by the Bergius process. F. Fischer and H. Tropsch. *Brennstoff-Chem.*, January 1, 1926, pp. 2–3.

SUGARS.—Acetone-sugars. Part VII. The constitution of diacetone-galactose. K. Freudenberg and K. Smeykal. *Ber.*, January 13, 1926, pp. 100–107.

VANILLIN.—A new synthesis of *o*-vanillin and *o*-veratraldehyde. F. Mauthner. *J. prakt. Chem.*, January, 1926, pp. 60–64.

Miscellaneous

DIAZO COMPOUNDS.—The diazotisation of picramide. L. Blangey. *Helv. Chim. Acta*, December, 1925, pp. 780–783.

HALOGEN COMPOUNDS.—A method for the preparation of 1 : 1 : 2-tri- and 1 : 1 : 1 : 2-tetrachlorethane. H. J. Prins. *Rec. Trav. Chim. Pays-Bas*, January, 1926, pp. 80–81.

Preparation of dibromacetaldehydeacetal by direct bromination of paraldehyde. R. Dworzak. *Monats. für Chem.*, January, 1926, pp. 253–259.

KETONES.—Refractometric investigation of methyl-hexahydroacetophenones. S. van Woerden. *Rec. Trav. Chim. Pays-Bas*, January, 1916, pp. 124–150.

MOLECULAR COMPOUNDS.—Organic molecular compounds. Parts X and XI. G. Weissenberger and F. Schuster. *Monats. für Chem.*, January 15, 1926, pp. 157–169.

ORGANO-METALLIC COMPOUNDS. Organo lead compounds. R. Danzer. *Monats. für Chem.*, January 15, 1926, pp. 241–244.

Quantitative investigation of the mercuration of nitrobenzene. J. Jürgens. *Rec. Trav. Chim. Pays-Bas*, January, 1926, pp. 61–67.

OXIDES.—The compression and decomposition of nitric oxide. E. Briner, H. Biedermann and A. Rothen. *Helv. Chim. Acta*, December, 1925, pp. 923–928.

(*Continued on p.* 184a.)

(Continued from p. 184)

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each

Abstracts of Complete Specifications

245,678. Dyestuff Emulsions, Production of. C. E. J. Goedecke, 68, Major Street, Manchester, and Colloisil Colour Co., Ltd., Bents Lane, Bredbury, near Stockport, Cheshire. Application date, April 9, 1925.

A colloidal emulsion or suspension is produced from a soluble dyestuff and a material which does not form a lake with the dyestuff solution. The material must be a colloid or capable of forming an emulsion or suspension when treated with a dyestuff solution in a colloid mill. Suitable materials are oil, fat, mineral oil, water-glass, soap, dextrine, starch, glue. Examples of dyestuffs thus treated are brilliant green and malachite green.

245,687. Solid Urea from Solutions, Production of. J. Y. Johnson, London. From Badische Anilin and Soda Fabrik, Ludwigshafen-on-Rhine, Germany. Application date, August 14, 1925.

In this process urea is obtained in a sandy form which is particularly suitable for use as a fertiliser. A urea solution of 90-95 per cent. strength is sprayed into a large container by means of a jet of air directed at right angles to the jet of solution. The air pressure should not be above 100 mm. of water, so that a coarse spray is obtained instead of a finely atomised mist. The drops solidify in the air, and a solid sandy product is obtained containing 95–96 per cent. urea. Alternatively, the solution may be sprayed by causing it to fall on a rotating disc.

245,703. Phenolic Condensation Products, Manufacture of. H. Wade, London. From S. Karpen and Bros., 636, West 22nd Street, Chicago, Ill., U.S.A. Application date, October 23, 1925.

These condensation products are obtained from phenols and methylals. The methylals are obtained by the condensation of an alcohol with formaldehyde in the presence of an acid condensing agent. To effect this condensation, 1·5 parts of methyl alcohol containing 1–2 per cent. of hydrochloric acid are mixed with one part of commercial formalin and one part of fused calcium chloride. The methylal is recovered by fractional distillation. The methylals are liquids stable in the presence of alkalis but hydrolysed in the presence of acids to form aldehydes and alcohols. The methylals are condensed with phenols or cresols in the presence of water and an acid condensing agent to form phenolic resins which are fusible, hard, and brittle, and soluble in aqueous alkalis, alcohol, ether, and acetone. The acid condensing agent is required in the proportion of 0·05 to 0·1 per cent. The production of the resin is effected in an autoclave in the presence of an excess of phenol.

245,856. Separation of Vaporised Organic Substances from Gaseous Mixtures. J. J. V. Armstrong, Liverpool. From N. V. Algemeenechemische Productenhandel, Anna Paulownastraat 34, The Hague, Holland. Application date, September 21, 1925.

Substances such as benzol, acetone, ether, are separated from air by means of absorption in carbon or other medium, and this invention comprises a suitable apparatus for the purpose. A cylindrical container is provided with heating or cooling pipes arranged in superposed horizontal layers, the pipes in each layer being arranged in zigzag formation. In an alternative form, the heating or cooling pipes are arranged in concentric or helical coils. In either case, the contents of the container are thus divided into thin layers, and transfer of heat is facilitated. The heating or cooling coils occupy 8–12 per cent. of the volume of the container.

245,587. Dyes and Dyeing. J. I. M. Jones, 39, Westbourne Road, Lancaster; B. Wylam, Carr House, Regent Street, Lancaster; J. Morton, Longlands, Lancaster; and Morton's Sundour Fabrics, Carlisle. Application dates, July 12 and 30, 1924.

This process is particularly for the preparation of derivatives of leuco compounds of anthraquinone vat dyestuffs. The leuco compounds are treated with an alkyl sulphuric acid halide—*e.g.*, methyl or ethyl sulphuric acid chloride. In an example, leuco flavanthrone is obtained by acidifying a flavanthrone alkali vat, filtering the free leuco compound, washing with air-free water, and with alcohol, and drying in a steam oven, or in vacuo over sulphuric acid. The leuco compound is suspended in carbon disulphide and light pyridine, and treated with methyl sulphuric acid chloride first at 20° C. and then at 80° C. The mixture is shaken with water and filtered. Other examples are given of the preparation of derivatives of leuco indanthrone and leuco anthraquinone 2 : 1-naphthacridone (Caledon red BN). The derivatives are stable in air and soluble in water or in dilute alkali solutions.

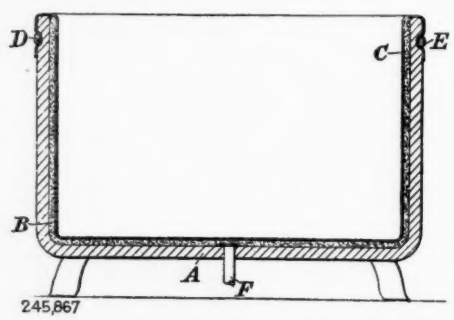
245,860. Recovery of Readily Liquefiable Constituents from Hydrocarbon Gas Mixtures, Process for. E. C. R. Marks, London. From Carbide and Carbon Chemicals Corporation, 30, East 42nd Street, New York. Application date, October 18, 1924.

In the process in which gasoline is recovered from natural gas or other hydrocarbon mixtures by condensing liquefiable constituents and rectifying them to separate volatile compounds such as propane, the rectification is effected at a pressure below atmospheric so that evaporation of gasoline after removal from the gasifying apparatus is decreased.

245,865. New Intermediate Compounds and Azo Dyestuffs, Manufacture of. British Dyestuffs Corporation, Ltd., 70, Spring Gardens, Manchester, and A. H. Saunders, Crumpsall Vale Chemical Works, Blackley, Manchester. Application date, October 21, 1924.

The starting materials in this process are the sulphon chlorides of phenol *o*-carboxylic acids which may be produced as described in Specification No. 18,430/1913. These compounds are reduced with a reducing agent other than alkaline sodium sulphite and converted into sulphinic acids which react with an aromatic nitro compound having a labile halogen atom yielding new nitro sulphones. The nitro group or groups in these sulphones can be reduced to obtain amines which are useful in the manufacture of azo dyestuffs, as they afford a means of introducing a chrome fixing group which is apart from the chromophoric portion of the molecule so that fixation by the mordant takes place without much change in the shade of the dyeing. The second component may be any suitable hydroxy-, amino- or amino-hydroxy compound. The amino sulphones may either be diazotised and coupled to a component such as alpha-naphthylamine or Cleve's acid which can be further diazotised and coupled to produce a chain in the known manner, or they may be diazotised and coupled to a component such as H acid which is capable of coupling again with a second diazo component which may be either simple or complex. Several examples are given of the products obtained starting from salicylic sulphon chloride and *o*-cresotinic sulphon chloride.

245,867. Acid Proof and Like Containers. A. Kelly, 57, Chancery Lane, London, W.C.2. Application date, October 23, 1924.



245,867

When tanks are rendered acid proof by a lining of india-rubber, difficulties are experienced in inserting the lining and attaching it to the tank. In this invention, the metal tank A

is provided with an internal lining of a permeable material B, such as felt. The sheet rubber lining C is shaped approximately to the contour of the vessel, and the edges are passed over the upper edge of the tank A and secured in a groove D by a ring E to form an air-tight closure. A pipe F communicates with any suitable exhausting apparatus, so that the space occupied by the felt lining becomes exhausted of air, and the atmospheric pressure within the tank presses the rubber lining against the walls without the necessity for cement or other fixing material.

245,903. SULPHURIC ACID, PROCESS FOR THE MANUFACTURE OF. W. Carpmael, London. From Farbenfabriken vorm. F. Bayer and Co., Leverkusen, near Cologne, Germany. Application date, December 5, 1924.

In the contact process for the manufacture of sulphuric acid, it has been found that an increased conversion has been obtained by a considerable reduction of the quantity of the catalyst employed—*i.e.*, 1 kilo for the conversion of 6–10 tons of sulphur per day, instead of the usual 1 kilo per 1 ton per day. The catalyst process may be combined with the chamber process to obtain a substantially total conversion. The process is also applicable to the contact process in which other catalysts such as iron oxide, spent pyrites or vanadium compounds are used. Thus the purified gases containing sulphur dioxide are passed through a catalytic plant containing iron oxide which converts part of the dioxide into trioxide. The remaining gases still containing sulphur dioxide may be converted into sulphuric acid in a plant such as that described in Specifications Nos. 149,648, 184,966 and 187,016 (see THE CHEMICAL AGE, Vol. III, p. 543; Vol. VII, pp. 461 and 714).

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention: 227,839 (Soc. Anon. de Produits Chimiques de Droogenbosch), relating to manufacture of chemically pure sulphuric acid, see Vol. XII, p. 315; 231,458 (Benzonaftene), relating to a method of using catalysers, see Vol. XII, p. 564; 241,903 (Chemische Fabrik Griesheim Elektron), relating to production of phosphoric acid, see Vol. XIII, p. 663.

International Specifications not yet Accepted

244,122. SYNTHETIC DRUGS. J. D. Riedel Akt.-Ges., 1, Riedelstrasse, Britz, Berlin. International Convention date, December 6, 1924.

Barbituric acids substituted in the C : C-position with an unsaturated aliphatic group and with a group $CH\langle^{R^1}_{R^2}$ in which R^1 and R^2 represent two different aliphatic, aromatic, or alicyclic radicles are prepared from the corresponding disubstituted malonic acid, or by introducing one of the groups into a barbituric acid substituted with respect to the other group. Several examples are given.

244,134. AMMONIA OXIDATION. I. W. Cederberg, 9, Hardenbergstrasse, Charlottenburg, Berlin. International Convention date, December 8, 1924.

Gas mixtures rich in oxygen are employed for the catalytic oxidation of ammonia without danger of explosion by employing a flat and very narrow reaction chamber. The two sides are of chrome-nickel steel plates 2, and the catalyst 5 is of platinum wire net or corrugated sheet. Water-cooling jackets 1 are provided. The reaction gases pass through from 6 to 7, and the reaction is started by directing a flame of hydrogen through openings 8, 9 upon the catalyst, the openings being closed by mica discs. A baffling device 15 is provided at the inlet to ensure mixing of the gases, and a nickel wire net 17 is also provided for this purpose. The speed of the gases is such that a temperature of about 600° C. is maintained.

244,450. ANTHRAQUINONE DERIVATIVES AND DYES. Farbwerke vorm. Meister, Lucius, and Brüning, Hoechst-on-Main, Germany. International Convention date, December 12, 1924.

This process is for obtaining 5 : 8-diarylido-1 : 4-dihydroxyanthraquinones and sulphonic acids. In an example, 5 : 8-dichlorquinizarin is heated with aniline and sodium acetate or with *p*-toluidine, and the products sulphonated with concentrated sulphuric acid.

244,461. CATALYTIC ADSORBENTS. Soc. de Recherches et d'Exploitations Pétroliferes, 75, Boulevard Haussmann, Paris. International Convention date, December 9, 1924.

Adsorbent catalytic substances are mixed with a binder and the mixture carbonised to harden it. This is followed by calcination in a closed vessel and treatment with acid and water, and finally calcination at a red heat.

244,462-3. ANTHRAQUINONE DERIVATIVES AND DYES. Farbenfabriken vorm. F. Bayer and Co., Leverkusen, near Cologne, Germany. International Convention date, December 9, 1924.

244,462. Two series of compounds are obtained by condensing either one or two molecules of formaldehyde with α-aminoanthraquinone or its derivatives in the presence of an acid condensing agent under such conditions that the products obtained are not decomposed by water or dilute acids. Loose combinations of formaldehyde and α-aminoanthraquinones can be further condensed with sulphuric acid to yield the same compounds. Various other condensing agents can be used. Examples are given of the production of (1) compounds of both series from 1 : 4-amino-oxyanthraquinone and paraformaldehyde in the presence of dilute sulphuric acid, a mixture of acetic acid with sulphuric or phosphoric acid, or sulphuric and boric acids; (2) a compound of the second series from phosphorus oxychloride, 1 : 4-amino-oxyanthraquinone and formaldehyde solution; (3) compounds of both series from 1 : 4-diamino-anthraquinone or 1 : 4-methoxy-aminoanthraquinone and trioxymethylene or paraformaldehyde in sulphuric acid; (4) compounds of the first series by oxidising compounds of the second series obtained from 1 : 4-amino-oxyanthraquinone with sulphuric acid or manganese dioxide and sulphuric acid and eliminating formaldehyde by washing with water.

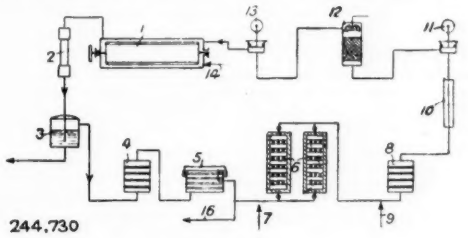
244,463. The condensation products obtained in 244,462 above are treated with oxidising agents to obtain other anthraquinone derivatives, some of which are vat dyestuffs. When the compounds of the second series are used, more oxidising agent is required, and a molecule of formaldehyde is eliminated. Oxidation is effected in sulphuric acid solution with manganese or lead dioxide, or concentrated or fuming sulphuric acid alone may be used. The compounds are of the nature of quinones and can be reduced and re-oxidised; in either case the compounds are applicable as dyestuffs. Examples are given of the oxidation of both series of compounds obtained from 1 : 4-amino-oxyanthraquinone and formaldehyde.

244,481. PIGMENTS. F. Rahtjen, 19, Mittelweg, Hamburg, and M. Ragg, Wentorf, Holstein, Germany. International Convention date, December 11, 1924.

Oxides or other compounds of lead, such as lead oxide, red lead, or white lead, are heated with vaseline, paraffin, ceresine, waste lubricating oil, waste anthracene, tar, pitch, hydrocarbons, phenols, illuminating or water gas. The products are mixed with binders to obtain paints having anti-corrosive properties and which do not thicken. Copper or arsenic compounds may also be added.

244,730. HYDROGENATION OF COAL. F. Bergius, 5, Albert Ueberlestrasse, Heidelberg, Germany. International Convention date, December 18, 1924.

The waste gases obtained in the hydrogenation of coal at high pressures, and which contain methane and some hydrogen,



244,730

are treated with steam at different temperatures to obtain gases rich in hydrogen for use again in the hydrogenation process. By treating with steam at high temperature, the methane is converted into hydrogen and carbon monoxide, and the carbon monoxide is then converted catalytically into hydrogen and carbon dioxide, the latter being removed. The

process can be applied to the preparation of gases rich in hydrogen from coke oven gases.

The gases from a hydrogenation chamber 1 pass through a condenser 2, liquid separator 3, and devices 4, 5, for removing benzene and sulphuretted hydrogen. Steam is admitted at 7, and the gases pass to a regeneratively superheated apparatus 6 where the first-mentioned reaction is effected. Steam or water is again admitted at 9, and the gases pass to a chamber 8 containing an iron oxide catalyst. The gases finally pass to a cooler 10, pump 11, scrubber 12 where carbon dioxide is removed, and pump 13 to the hydrogenation chamber 1.

244,697. CRACKING HYDROCARBONS. Allgemeine Ges. für Chemische Industrie, 61, Martin-Lutherstrasse, Schöneberg, Berlin. International Convention date, December 19, 1924.

Hydrocarbon oils are freed from substances soluble in liquid sulphur dioxide either by treatment with liquid sulphur dioxide or with active carbon, silica gel, or sulphuric acid. The oil is then treated with aluminium chloride, yielding a brownish-yellow oil which is employed as a catalyst in the treatment of high-boiling hydrocarbons to obtain lighter hydrocarbons.

LATEST NOTIFICATIONS.

247,176. Method for the utilisation of methane. Patart, G. February 7, 1925.

247,177. Method for the synthetic production of higher alcohols. Patart, G. February 7, 1925.

247,178. Method for the simultaneous manufacture of methyl alcohol and liquid hydrocarbons by synthesis. Patart, G. February 7, 1925.

247,187. Process of dyeing leather with acid azo dyestuffs. I. G. Farbenindustrie Akt.-Ges. February 3, 1925.

247,188. Process for the production of 2-hydrazino-5-nitropyridine. Rath, Dr. C. February 5, 1925.

247,211. Process for producing fast-coloured resists under aniline black. I. G. Farbenindustrie Akt.-Ges. February 5, 1925.

247,219. Process for the production of phosphorus, phosphorus pentoxide, and phosphoric acid. I. G. Farbenindustrie Akt.-Ges. February 6, 1925.

247,224. Process of dyeing mixed textile goods. I. G. Farbenindustrie Akt.-Ges. February 7, 1925.

247,225. Method of synthetically producing ammonia. Uhde, F. February 9, 1925.

247,226. Method of synthetically producing ammonia. Uhde, F. February 9, 1925.

247,227. Process for the manufacture of ammonium nitrate in water solution and simultaneous concentration thereof. Azogeno Soc. Anon. per La Fabbricazione Dell'ammoniaca Sintetica E Prodotti Derivati, and Toniolo, C. February 7, 1925.

247,228. Process for rapid evaporation to dryness of ammonium nitrate solutions. Azogeno Soc. Anon. Per La Fabbricazione Dell'ammoniaca Sintetica E Prodotti Derivati, and Toniolo, C. February 7, 1925.

247,229. Process for concentrating ammonium nitrate solutions. Azogeno Soc. Anon. Per La Fabbricazione Dell'ammoniaca Sintetica E Prodotti Derivati, and Toniolo, C. February 7, 1925.

247,230. Process for the manufacture of calcium nitrate together with acid calcium phosphates or phosphoric acid. Azogeno Soc. Anon. Per La Fabbricazione Dell'ammoniaca Sintetica E Prodotti Derivati, and Toniolo, C. February 7, 1925.

Specifications Accepted with Date of Application

225,842. Ores and metallurgical products, Treatment of. F. Johannsen. December 7, 1923.

225,885. Oxygenic organic compounds or mixtures containing them, Process for reducing. Naamlooze Vennootschap Handelsonderneming Feynald Maatschappij Tet Exploitatie van Octrooien. December 7, 1923.

228,557. Dyeing cellulose esters, Process of. Farbwerke vorm. Meister, Lucius, and Brüning. January 29, 1924.

228,889. Vegetable oils, Process of refining. Aktiebolaget Separator. February 6, 1924.

228,913. Azo dyestuffs, Process for producing. Farbwerke vorm. Meister, Lucius, and Brüning. February 8, 1924.

229,668. New Dyestuffs of the anthraquinone series, Manufacture of. Farbenfabrikenvorm. F. Bayer and Co. February 18, 1924.

231,149. New Dyestuffs and intermediate products, Manufacture of. Soc. of Chemical Industry in Basle. March 20, 1924.

235,916. Centrifugal separators for separating solids from liquids. Laughlin Filter Corporation. June 21, 1924.

234,041. Hydrogen, Manufacture of—by the partial liquefaction of gaseous mixtures containing the same. L'Air Liquide Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude. May 15, 1924.

236,151. Distillation of bituminous coal in several stages, Process of. Allgemeine Vergasungs-Ges. June 24, 1924.

246,529. Hydroxy anthraquinones, Production of. J. Thomas, H. W. Hereward and Scottish Dyes, Ltd. October 22, 1924.

246,569. Running off hot liquids from a container under pressure, Means for. W. Carpmael. (*Farbenfabriken vorm. F. Bayer and Co.*) October 28, 1924.

246,570. Colloid solutions, Preparations of. C. S. Smith. October 28th, 1924.

246,627–8. Metallurgical furnaces. B. Talbot. December 5, 1924.

246,683. Condensation products of the anthraquinone series, Manufacture of. Farbwerke vorm. Meister, Lucius, and Brüning. February 23, 1925. Addition to 205,502.

246,757. Electrical precipitation apparatus. Lodge Cottrell, Ltd., and N. Stallard. (*Metallbank und Metallurgische Ges. Akt.-Ges.*) September 23, 1925. Addition to 176,713.

Applications for Patents

Ainsworth, J. Treatment of crude benzol. 3,834. February 10.

Alliott, E. A. and Alliott and Co., Ltd., Manlove. Centrifugal Separators. 3,851. February 10.

Azogeno Soc. Anon. per la Fabbricazione dell' Ammoniaca Sintetica é Prodotti Derivati and Toniolo, C. Manufacture of ammonium-nitrate. 3,592. February 8. (Italy, February 7, 1925.)

Azogeno Soc. Anon. per la Fabbricazione dell' Ammoniaca Sintetica é Prodotti Derivati and Toniolo, C. Evaporation of ammonium-nitrate solutions. 3,593. February 8. (Italy, February 7, 1925.)

Azogeno Soc. Anon. per la Fabbricazione dell' Ammoniaca Sintetica é Prodotti Derivati and Toniolo, C. Concentration of ammonium-nitrate solutions. 3,594. February 8. (Italy, February 7, 1925.)

Azogeno Soc. Anon. per la Fabbricazione dell' Ammoniaca Sintetica é Prodotti Derivati and Toniolo, C. Manufacture of calcium nitrate, etc. 3,595. February 8. (Italy, February 7, 1925.)

Baddiley, J., British Dyestuffs Corporation, Ltd., and Hill, J. Azo dyestuffs, etc. 4,096. February 12.

Brandenberger, J. E. Manufacture of artificial silk. 4,180. February 13.

British Celanese, Ltd. Treatment of aliphatic compounds. 4,194. February 13.

Burn, L. Production of silica gel. 3,941. February 11.

Carpmael, W. and I. G. Farbenindustrie Akt.-Ges. Manufacture of chromium compounds. 3,553. February 8.

Deutsche Gold- und Silber Scheideanstalt vorm. Roessler. Production of 2-hydrazino-5-nitropyridene. 4,119. February 12. (Austria, July 22, 1925.)

Empson, A. W. Centrifugal separators. 3,712. February 9.

Flor, K., Lichtenberger, T., and Salzwerk Heilbronn Akt.-Ges. Obtaining sulphur from alkaline earth sulphates. 3,733. February 9. (Germany, September 25, 1925.)

Grasselli Chemical Co. and Marks, E. C. R. Apparatus for drying and heating. 3,742. February 9.

Hall, A. J. Processes for dyeing cellulose-acetate materials. 3,783. February 10.

Hazlewood, E. Manufacture of soap. 4,049. February 12.

I. G. Farbenindustrie Akt.-Ges. Process of dyeing mixed textile goods. 3,558. February 8. (Germany, February 7, 1925.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of organic compounds from coal, etc. 3,984, 3,985, 3,986. February 11. (Germany, February 14, 1925.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of organic compounds from distillation products of coal, etc. 3,987, 3,988, 3,989. February 11. (Germany, February 16, 1925.)

I. G. Farbenindustrie Akt.-Ges. Preparation of emulsions. 4,003. February 11. (Germany, February 11, 1925.)

Minerals Separation, Ltd. Concentration of ores, etc. 3,720. February 9.

Neill, O. S. Production of ferric oxides. 3,749. February 9.

Pease and Partners, Ltd. Treatment of crude benzol. 3,834. February 10.

Pellerin, A. Manufacture of a cellulose product. 4,113. February 12. (France, December 30, 1925.)

Schestakoff, P. I. Manufacture of naphtha-sulphonic acids and salts thereof. 3,706. February 9. (Germany, February 17, 1925.)

Schmidding, W. Treating tung oil. 4,187. February 13. (Germany, February 13, 1925.)

Scottish Dyes, Ltd., Thomas, J. and Wylam, B. Dyeing. 4,104. February 12.

Skertchly, W. P. Treatment of aliphatic compounds. 4,194. February 13.

Soc. of Chemical Industry in Basle. Manufacture of dyestuffs. 3,685. February 9. (Switzerland, February 14, 1925.)

Trent, W. E. Carbonising processes. 3,573. February 8.

Uhde, F. Synthesis of ammonia. 3,565, 3,566. February 8. (Germany, February 9, 1925.)

Verein für Chemische und Metallurgische Produktion. Treatment of copper containing sulphide ores, etc. 3,959. February 11. (Czecho-Slovakia, February 26, 1925.)

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £37 per ton, Powder, £39 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength, and locality.

ACID NITRIC, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, packages extra, returnable.

BLEACHING POWDER.—Spot, £9 10s. d/d; Contract, £8 10s. d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystal, £25 per ton. Powder, £26 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)

CALCIUM CHLORATE (SOLID).—£5 12s. 6d. to £5 17s. 6d. per ton d/d, carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 64 O.P.—Industrial, 2s. 5d. to 2s. 11d. per gall. Mineralised, 3s. 8d. to 4s. per gall., in each case according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER 60/62%.—£17 per ton for home market, 1-cwt. iron drums included.

SODIUM CHLORATE.—3d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—4¾d. to 5¼d. per lb. Crude 60's, 1s. 5d. to 1s. 6d.

ACID CRESYLIC 97/99.—1s. 8d. to 1s. 9d. per gall. Pale, 95%, 1s. 6d. to 1s. 8d. per gall. Dark, 1s. 3d. to 1s. 5d. per gall. Good demand.

ANTHRACENE.—A quality, 3d. to 4d. per unit; Paste 40%, 3d. per unit per cwt. Nominal price.

ANTHRACENE OIL, STRAINED.—7d. to 8d. per gall. Unstrained, 6¼d. to 7½d. per gall.

BENZOL.—Crude 65's, 1s. 2½d. to 1s. 3½d. per gall., ex works in tank wagons. Standard Motor, 1s. 8d. to 1s. 10d. per gall., ex works in tank wagons. Pure, 1s. 10d. to 2s. 2d. per gall., ex works in tank wagons.

TOLUOL.—90%, 1s. 9½d. to 2s. per gall. Pure, 1s. 11d. to 2s. 2d. per gall.

XYLOL.—2s. to 2s. 6d. per gall.

CREOSOTE.—Cresylic, 20/24%, 9d. to 10d. per gall. Standard specification, middle oil, heavy, 6½d. to 7d. per gall.

NAPHTHA.—Crude, 9d. to 1s. per gall. Solvent 90/160, 1s. 5d. to 1s. 8d. per gall. 2s. paid in South. Steady demand. Solvent 90/190, 1s. to 1s. 2d. per gall.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £3 10s. to £4 10s. per ton. Whizzed or hot pressed, £5 10s. to £7 10s.

NAPHTHALENE.—Crystals and Flaked, £11 10s. to £13 per ton, according to districts.

PITCH.—Medium soft, 62s. 6d. to 64s. per ton, according to district. Market active.

PYRIDINE.—90/140, 19s. 6d. to 21s. per gall. Firmer. Heavy, 7s. to 10s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated.

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—7s. per lb. 100%.

ACID BENZOIC.—1s. 9d. per lb.

ACID GAMMA.—8s. per lb.

ACID H.—3s. 3d. per lb. 100% basis d/d.

ACID NAPHTHIONIC.—2s. 2d. per lb. 100% basis d/d.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb. 100% basis d/d.

ACID SULPHANILIC.—9d. per lb. 100% basis d/d.

ANILINE OIL.—7d. per lb. naked at works.

ANILINE SALTS.—7d. per lb. naked at works.

BENZALDEHYDE.—2s. 1d. to 2s. 2d. per lb. Good home inquiry.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

o-CRESOL 29/31° C.—3d. to 3¼d. per lb. Demand quiet.

m-CRESOL 98/100%.—2s. 1d. to 2s. 3d. per lb. Demand moderate.

p-CRESOL 32/34° C.—2s. 1d. to 2s. 3d. per lb. Demand moderate.

DICHLORANILINE.—2s. 3d. per lb.

DIMETHYLANILINE.—1s. 11d. to 2s. per lb. d/d. Drums extra.

DINITROBENZENE.—9d. per lb. naked at works.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLANILINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d. Fair home inquiry.

B-NAPHTHOL.—11d. to 1s. per lb. d/d. Fair home inquiry.

a-NAPHTHYLAMINE.—1s. 3d. per lb. d/d. Fair home inquiry.

B-NAPHTHYLAMINE.—3s. 9d. per lb. d/d. Fair home inquiry.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. 6d. per lb. d/d.

p-NITRANILINE.—1s. 9d. to 1s. 10d. per lb. d/d. Fair home inquiry.

NITROBENZENE.—5d. per lb. naked at works. Good home inquiry.

NITRONAPHTHALENE.—10d. per lb. d/d.

R. SALT.—2s. 4d. per lb. 100% basis d/d.

SODIUM NAPHTHIONATE.—1s. 9d. per lb. 100% basis d/d.

o-TOLUIDINE.—8d. per lb. naked at works.

p-TOLUIDINE.—2s. 2d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 11d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £8 15s. to £9. Firmer. Grey, £17 10s. per ton. Better inquiry. Liquor, 9d. per gall. 32° Tw.

ACETONE.—£81 per ton.

CHARCOAL.—£7 5s. to £9 per ton, according to grade and locality. Demand good.

IRON LIQUOR.—1s. 6d. per gall. 32° Tw. 1s. 2d. per gall., 24° Tw.

RED LIQUOR.—9½d. to 1s. per gall.

WOOD CREOSOTE.—2s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 10d. per gall. 60% O.P. Solvent, 4s. 6d. per gall. 40% O.P. Very quiet.

WOOD TAR.—£3 to £5 per ton, according to grade.

BROWN SUGAR OF LEAD.—£40 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 5d. per lb., according to quality, Crimson, 1s. 3d. to 1s. 7½d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—2s. per lb.

BARYTES.—£3 10s. to £6 15s. per ton, according to quality.

CADMIUM SULPHIDE.—2s. 9d. per lb.

CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£50 to £55 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5¾d. to 6¼d. per lb.

LAMP BLACK.—£35 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb. carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—5s. 3d. per lb.

ZINC SULPHIDE.—1s. 1d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, 80% B.P.—£39 per ton ex wharf London in glass containers.
ACID, ACETYL SALICYLIC.—2s. 5d. to 2s. 7d. per lb. Keen competition met. Good demand.
ACID, BENZOIC B.P.—2s. to 2s. 3d. per lb., according to quantity.
ACID, BORIC B.P.—Crystal, £43 per ton; Powder, £47 per ton. Carriage paid any station in Great Britain, in ton lots.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—1s. 3½d. to 1s. 4d. per lb., less 5%. Unsettled.
ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.
ACID, PYROGALLIC, CRYSTALS.—5s. 3d. per lb. Resublimed, 7s.
ACID, SALICYLIC.—1s. 4d. to 1s. 6d. per lb. Technical.—10½d. to 11d. per lb.
ACID, TANNIC B.P.—2s. 10d. per lb.
ACID, TARTARIC.—1s. 0½d. per lb., less 5%. Market firm.
AMIDOL.—6s. 6d. per lb., d/d.
ACETANILIDE.—1s. 7d. to 1s. 8d. per lb. for quantities.
AMIDOPYRIN.—12s. 6d. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 6d. per lb., according to quantity.
AMMONIUM CARBONATE B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks.
ATROPINE SULPHATE.—11s. per oz. for English make.
BARBITONE.—10s. per lb.
BENZONAPHTHOL.—3s. 3d. per lb. spot.
BISMUTH CARBONATE.—15s. 6d. to 17s. 6d. per lb.
BISMUTH CITRATE.—12s. 9d. to 14s. 9d. per lb.
BISMUTH SALICYLATE.—12s. 6d. to 14s. 6d. per lb.
BISMUTH SUBNITRATE.—13s. to 15s. per lb. according to quantity.
BORAX B.P.—Crystal, £27; Powder, £28 per ton. Carriage paid any station in Great Britain, in ton lots.
BROMIDES.—Potassium, 1s. 9d. to 1s. 11d. per lb.; sodium, 2s. to 2s. 2d. per lb.; ammonium, 2s. 3d. to 2s. 5d. per lb., all spot.
CALCIUM LACTATE.—1s. 4d. to 1s. 5d. Market firmer.
CHLORAL HYDRATE.—3s. 3d. to 3s. 6d. per lb., duty paid.
CHLOROFORM.—2s. 3d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
FORMALDEHYDE.—£40 per ton, in barrels ex wharf.
GUAIACOL CARBONATE.—7s. per lb.
HEXAMINE.—2s. 4d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 8d. per gallon f.o.r. makers' works, naked.
HYDROQUINONE.—4s. 4½d. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 3s. 6d. per lb., for 28-lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
IRON AMMONIUM CITRATE B.P.—2s. to 2s. 3d. per lb. Green, 2s. 4d. to 2s. 9d. per lb. U.S.P., 2s. 1d. to 2s. 4d. per lb.
MAGNESIUM CARBONATE.—Light Commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light Commercial, £67 10s. per ton, less 2½%, price reduced; Heavy Commercial, £23 per ton, less 2½%; Heavy Pure, 2s. to 2s. 3d. per lb., according to quantity.
MENTHOL.—A.B.R. recrystallised B.P., 26s. net per lb., Synthetic, 17s. 6d. to 22s. 6d. per lb., according to quality. English make.
MERCURIALS.—Red oxide, 5s. 5d. to 5s. 7d. per lb.; Corrosive sublimate, 3s. 9d. to 3s. 11d. per lb.; white precipitate, 4s. 6d. to 4s. 8d. per lb.; Calomel, 4s. to 4s. 2d. per lb.
METHYL SALICYLATE.—1s. 7d. per lb.
METHYL SULPHONAL.—16s. 6d. per lb.
METOL.—9s. per lb. British make.
PARAFORMALDEHYDE.—1s. 11d. for 100% powder.
PARALDEHYDE.—1s. 4d. per lb.
PHENACETIN.—4s. to 4s. 3d. per lb.
PHENAZONE.—6s. to 6s. 3d. per lb. Spot lower than forward price.
PHENOLPHTHALEIN.—4s. to 4s. 3d. per lb. Supply exceeds demand.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—80s. per cwt., less 2½% for ton lots. Market very firm.
POTASSIUM CITRATE.—1s. 11d. to 2s. 2d. per lb.
POTASSIUM FERRICYANIDE.—1s. 9d. per lb. in cwt. lots. Quiet.
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity. Steady market.
POTASSIUM METABISULPHITE.—7½d. per lb., 1-cwt. kegs included, f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 7½d. per lb., spot, slightly easier.
QUININE SULPHATE.—2s. 3d. to 2s. 4d. per oz., in 100 oz. tins. Steady market.
RESORCIN.—3s. 9d. per lb. In fair quantities.
SACCHARIN.—51s. 5d. to 53s. 8d. per lb., according to quantity. Limited inquiry.
SALOL.—3s. per lb.
SODIUM BENZOATE, B.P.—1s. 10d. to 2s. 2d. per lb.
SODIUM CITRATE, B.P.C., 1911.—1s. 8d. to 1s. 11d. per lb., B.P.C., 1923. 1s. 11d. to 2s. 2d. per lb., according to quantity.
SODIUM FERROCYANIDE.—4d. per lb. carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£14 to £15 per ton, according to quantity, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—75s. to 80s. per cwt., according to quantity.
SODIUM SALICYLATE.—Powder, 1s. 10d. to 2s. per lb. Crystal, 1s. 11d. to 2s. 1d. per lb. Very heavy demand.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.
SODIUM SULPHITE, ANHYDROUS, £27 10s. to £28 10s. per ton, according to quantity; 1-cwt. kegs included.
SULPHONAL.—11s. 6d. per lb. Limited demand.
TARTAR EMETIC, B.P.—Crystal or Powder, 1s. 8d. to 1s. 11d. per lb.
THYMOL.—12s. to 13s. 9d. per lb. Strong demand.

Perfumery Chemicals

ACETOPHENONE.—9s. per lb.
AUBEPINE (EX ANETHOL).—9s. 6d. per lb.
AMYL ACETATE.—3s. per lb.
AMYL BUTYRATE.—6s. 6d. per lb.
AMYL SALICYLATE.—3s. 3d. per lb.
ANETHOL (M.P. 21/22° C.).—5s. 6d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. 3d. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—2s. 3d. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 9d. per lb.
BENZYL BENZOATE.—2s. 9d. per lb.
CINNAMIC ALDEHYDE NATURAL.—17s. 6d. per lb.
COUMARIN.—11s. 9d. per lb.
CITRONELLOL.—15s. per lb.
CITRAL.—9s. per lb.
ETHYL CINNAMATE.—9s. per lb.
ETHYL PHTHALATE.—3s. per lb.
EUGENOL.—9s. 6d. per lb.
GERANIOL (PALMAROSA).—21s. per lb.
GERANIOL.—7s. to 16s. per lb.
HELIOTROPINE.—6s. per lb.
ISO EUGENOL.—14s. 6d. per lb.
LINALOL EX BOIS DE ROSE.—17s. 6d. per lb.
LINALYL ACETATE.—17s. 6d. per lb.
METHYL ANTHRANILATE.—9s. 3d. per lb.
METHYL BENZOATE.—5s. per lb.
MUSK KETONE.—30s. per lb.
MUSK XYLOL.—5s. 9d. per lb.
NEROLIN.—4s. per lb.
PHENYL ETHYL ACETATE.—12s. per lb.
PHENYL ETHYL ALCOHOL.—9s. 6d. per lb.
RHODINOL.—32s. 6d. per lb.
SAFROL.—1s. 4d. per lb.
TERPINEOL.—1s. 8d. per lb.
VANILLIN.—21s. 6d. to 24s. per lb. Good demand.

Essential Oils

ALMOND OIL.—12s. 6d. per lb.
ANISE OIL.—3s. 7d. per lb.
BERGAMOT OIL.—27s. per lb.
BOURBON GERANIUM OIL.—12s. 6d. per lb.
CAMPHOR OIL.—60s. per cwt.
CANANGA OIL, JAVA.—16s. per lb.
CINNAMON OIL, LEAF.—5d. per oz.
CASSIA OIL, 80/85%.—10s. per lb.
CITRONELLA OIL.—Java, 85/90%, 3s. 6d. Ceylon, 2s. 6d. per lb.
CLOVE OIL.—7s. 3d. per lb.
EUCALYPTUS OIL, 70/75%.—1s. 10d. per lb.
LAVENDER OIL.—French 38/40%, Esters, 22s. 6d. per lb.
LEMON OIL.—12s. 6d. per lb.
LEMONGRASS OIL.—4s. 9d. per lb.
ORANGE OIL, SWEET.—12s. per lb.
OTTO OF ROSE OIL.—Bulgarian, 65s. per oz. Anatolian, 35s. per oz.
PALMA ROSA OIL.—12s. 6d. per lb.
PEPPERMINT OIL.—Wayne County, 130s. per lb. Japanese, 15s. per lb.
PETITGRAIN OIL.—9s. 3d. per lb.
SANDAL WOOD OIL.—Mysore, 26s. per lb. Australian, 18s. 6d. per lb.

Artificial Silk Developments

ARTIFICIAL silk developements continue. A new company is to be formed in Drummondville, Quebec, with $10,000,000 capital, and to be known as Canadian Celanese, Ltd. British and Canadian interests are involved, and subject to Government arrangement the factory will be erected immediately to employ between 3,000 and 4,000 men. Later the company will manufacture artificial leather, photographic films and non-flammable celluloid. Cotton linters will be the chief raw material.—The Glanzstoff Company announces an entirely new product possessing warming properties, as opposed to the artificial silk, which has hitherto been cold. It is claimed to be suitable for hand-work or weaving.—The American Cellulose and Chemical Manufacturing Co., Ltd., is expanding production and increasing plant at Amcelle. The capacity is now about 12,000 pounds per day. About half this figure is being manufactured.—The Viscose Co., one of the largest U.S. rayon producers, will construct a factory at Parkersburg, W. Van., which will employ about 3,000 workmen.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

London, February 19, 1926.

BUSINESS has been fairly steady during the current week, but orders, unfortunately, are still in the main for relatively small quantities and near delivery. Undoubtedly the uncertainty in the industrial outlook militates against a more speedy recovery in business. Prices remain remarkably steady, and the few changes that are noted tend to be in the upward direction. Export trade continues only moderately satisfactory.

General Chemicals

ACETONE is unchanged in value and the material is very firm at £81 to £83 per ton, ex store, with a good demand.

ACID ACETIC has been moderately active, and price is unchanged.

ACID FORMIC price is well maintained, and the material is in good demand at £50 to £51 per ton.

ACID LACTIC demand has improved, and is quoted at £43 to £43 10s per ton for 50% by weight.

ACID OXALIC.—The increased price is maintained and the demand is fairly good.

ACID TARTARIC continues quiet, and is quoted at 11¼d. to 11½d. per lb.

ALUMINA SULPHATE continues active, and is nominally unchanged at £5 15s. per ton for 17/18%.

AMMONIUM CHLORIDE continues inactive, and the price is barely maintained at £18 per ton.

ARSENIC.—There has been some small inquiry, but not sufficient to throw any reflection on the market value, which is £13 10s. to £14 per ton.

BARIUM CHLORIDE is scarce, and price extremely firm at £10 10s. per ton.

BLEACHING POWDER is unchanged.

CREAM OF TARTAR is not quite so active, but the price is firm at £76 to £77 per ton, and some export inquiry is in evidence.

EPSOM SALTS are very firm at £5 15s. per ton.

FORMALDEHYDE is in quietly steady request at £41 to £42 per ton.

LEAD ACETATE is a little better, and is quoted at £43 to £44 per ton for white, and £42 to £43 per ton for brown.

LIME ACETATE is unchanged at last quoted figure.

LITHOPONE remains in steady request at £19 per ton.

METHYL ALCOHOL is unchanged at £48 per ton, with only a small demand.

METHYL ACETONE is extremely firm, and supplies scarce at £59 to £60 per ton.

POTASSIUM CARBONATE and CAUSTIC are unchanged.

POTASSIUM CHLORATE firm at 4¼d. to 4½d. per lb.

POTASSIUM PERMANGANATE has been active, and is extremely firm at 7½d. to 7¾d. per lb.

POTASSIUM PRUSSIATE is still slow to sell, and there are one or two odd parcels being offered at round about 7¼d. per lb.

SODIUM ACETATE.—The advance in price is maintained, and the material is extremely firm at £20 to £21 per ton.

SODIUM BICHROMATE is unchanged at British makers' figures.

SODIUM CHLORATE.—The advance in price is maintained, and it is quoted at 3½d. per lb., ex store.

SODIUM NITRITE has been fairly active at £22 per ton, ex store.

SODIUM PHOSPHATE has been a bright spot, and for available supplies a quotation of £13 10s. per ton is made.

POTASSIUM PRUSSIATE is unchanged at 4¼d. per lb., with only a quiet demand.

SODIUM SULPHIDE is unchanged.

ZINC SULPHATE has been fairly active at £13 10s. per ton.

Coal Tar Products

There is little change to report in the market for coal tar products from last week, the market generally maintaining a firm tone.

90% BENZOL is Steady at 1s. 9d. per gallon on rails, while motor benzol is quoted at 1s. 8¾d. per gallon.

PURE BENZOL is unchanged at 2s. 1d. to 2s. 2d. per gallon, on rails.

CREOSOTE OIL is quoted at 6d. to 6¼d. per gallon on rails, in the North, while the price in London is 7⅛d. per gallon.

CRESYLIC ACID is steady, and is quoted at 2s. to 2s. 1d. per gallon on rails for the pale quality 97/99%, for export, while the dark quality 95/97%, also for export, is quoted at 1s. 11d. to 2s. per gallon on rails. For the home trade the pale quality is quoted at 1s. 7d. per gallon on rails, and the dark quality at 1s. 6d. per gallon on rails.

SOLVENT NAPHTHA is firm, at 1s. 5d. to 1s. 6d. per gallon on rails.,

HEAVY NAPHTHA is unchanged at 1s. 1d. to 1s. 2d. per gallon, on rails.

NAPHTHALENES are unchanged, the lower grades being worth £4 to £4 10s. per ton, 76/78 quality about £6 per ton, and 74/76 quality about £5 10s. per ton.

PITCH.—The market is firm with renewed demand for export, and prices are again advancing. To-day's approximate values are 62s. 6d. to 65s. per ton, f.o.b. U.K. ports.

Latest Oil Prices

LONDON.—LINSEED OIL quiet and 2s. 6d. to 5s. lower; spot, £31 5s. ex mill; February to April, £30 2s. 6d.; May-August, £30 5s.; September-December, £30 10s. RAPE OIL quiet. Crude crushed, spot, £47; technical refined, £50. COTTON OIL steady. Refined common edible, £42; Egyptian crude, £35; deodorised, £44. TURPENTINE steady and occasionally 6d. per cwt. higher. American, spot, 64s.; March-April, 64s. 3d.; May-June, 63s. 6d.; and July-December, 61s. 6d.

HULL.—LINSEED OIL.—Spot, £31 10s.; February, £30 15s.; March-April and May-August, £30 10s.; September-December, £30 12s. 6d. COTTON OIL.—Bombay crude, £32 10s.; Egyptian crude, £34 5s.; edible refined, £37 10s.; technical, £36 10s. PALM KERNEL OIL.—Crushed, naked, 5½ per cent., £41. GROUNDNUT OIL.—Crushed-extracted, £42 15s.; deodorised, £46 15s. SOYA OIL.—Extracted and crushed, £38; deodorised, £41 10s. RAPE OIL.—Extracted and crushed, £47 per ton, net cash terms, ex mill.

Nitrogen Products Market

Export.—During the last week the sulphate of ammonia position has remained unchanged. The demand from the continent has been somewhat disappointing, but all other consuming countries have shown considerable interest. British producers are holding for £12 7s. 6d., f.o.b. U.K. port in single bags, with higher prices for March/April shipments. The American position shows sulphate of ammonia a little firmer on account of the increased demand from fertiliser manufacturers.

Home.—Merchants in many parts of the country report an improving demand both for prompt and March/May delivery. It is understood that home sales for the year have now reached 100,000 tons, about 8,000 tons in excess of the total up to mid-February last year. This indicates a very heavy season. Home prices have been announced now for two or three months, and it is most unlikely that any alteration will take place.

Nitrate of Soda.—The nitrate position remains unchanged. Cargoes, c.i.f. chief European ports, are fetching £11 11s. per ton for prompt arrival. Higher prices are being quoted for later arrival. As stocks in Europe have been liquidated to a great extent, the change in the market position seems amply justified.

Synthetic Methanol Developments

THE U.S. Customs Service has held that no countervailing duty can be assessed on synthetic methanol from Switzerland as requested by American methanol makers, owing to a report by officials of the Customs Service abroad that the bounty previously paid to a Swiss manufacturer is no longer in effect. The methanol tariff report of the Tariff Commission will be placed before the Advisory Board of the Commission shortly. The home costs are tabulated, but the German manufacturers refused to divulge their costs, and the Commission will have to use invoice prices in tabulating its foreign costs.

FIVE MEN WERE KILLED last week at the carbonite works at Schlebusch when an explosion occurred in a dynamite production building.

PART OF THE SURPLUS REVENUE of the Commonwealth of Australia, which in 1924–25 amounted to more than £3,000,000, is to be devoted to the reorganisation of the Institute of Science and Industry and for prospecting for oil and precious metals.

A CEMENT FACTORY is to be erected at Westport, N.Z., where all raw materials are available. The National Portland Cement Co., Ltd. (of New Zealand), are the movers and the proposed output will be 52,000 tons per annum. The services of Mr. F. W. Major, cement chemist, has been retained.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, February 19, 1926.

THE Heavy Chemical market has been quite active during the past week, good inquiry being received both for home and export, with the proportion of orders booked fair. There are no important changes in prices to record, although one or two continental products are rather higher.

Industrial Chemicals

ACID ACETIC 98/100%.—Quoted £55 to £67 per ton according to quantity and packing, c.i.f. U.K. port. 80% pure, £40 to £41 per ton; 80% technical, £38 to £39 per ton. packed in casks, c.i.f. U.K. ports.

ACID BORIC.—Crystal, granulated, or small flaked, £37 per ton; powdered, £39 per ton packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—Inquiry remains fair and quoted price unchanged at about 5¼d. per lb. delivered or f.o.b. U.K. ports.

ACID CITRIC, B.P. CRYSTALS.—Unchanged at about 1s. 3⅜d. per lb., less 5%, ex wharf; in moderate demand.

ACID FORMIC 85%.—Quoted £49 10s. per ton, ex wharf, prompt shipment. Spot material available at about £51 per ton, ex store.

ACID HYDROCHLORIC.—In little demand. Price 6s. 6d. per carboy, ex works.

ACID NITRIC 80°.—Remains unchanged at £23 5s. per ton, ex station, full truck loads.

ACID OXALIC 98/100%.—Offered from the Continent at about 3⅝d. per lb., ex wharf, prompt shipment. Spot material quoted 3¾d. per lb., ex store.

ACID SULPHURIC.—144°, £3 12s. 6d. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—In rather poor demand, but quoted price unchanged at about 11½d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE, 17/18% IRON FREE.—On offer from the Continent at about £5 10s. per ton, c.i.f. U.K. ports. Spot material available at £6 5s. per ton, ex store.

ALUM, LUMP POTASH.—Quoted £7 15s. per ton, c.i.f. U.K. ports, prompt shipment. Spot material available at about £9 2s. 6d. per ton, ex store. Powdered quality on offer from the Continent at about £7 10s. per ton, c.i.f. U.K. ports.

AMMONIA ANHYDROUS.—Now quoted 1s. 3½d. per lb., ex station, containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton, packed in 5 cwt. casks, delivered or f.o.b. U.K. ports. Industrial quality about £10 per ton less.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £26 to £27 per ton, ex station. On offer from the Continent at about £22 10s. per ton, c.i.f. U.K. ports. Fine white crystals quoted £18 15s. per ton, c.i.f. U.K. ports, prompt shipment from the Continent.

ARSENIC.—In rather poor demand, but prices remain unchanged. Spot material quoted £17 per ton, ex store. Offered for prompt shipment from works at £16 10s. per ton, ex wharf.

BARIUM CHLORIDE 98/100%.—White crystal powder offered from the Continent at about £8 10s. per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—English material quoted £9 10s. per ton, ex station. Contracts 20s. per ton less. On offer from the Continent at about £7 15s. per ton, c.i.f. U.K. ports.

BARYTES.—English material unchanged at £5 5s. per ton, ex works. Continental quoted £5 per ton, c.i.f. U.K. ports.

BORAX.—Granulated, £22 10s. per ton; crystals, £23 per ton; powdered, £24 per ton, carriage paid U.K. stations.

CALCIUM CHLORIDE.—English manufacturers' price unchanged at £5 12s. 6d. to £5 17s. 6d. per ton, carriage paid U.K. stations. Continental dearer at about £4 per ton, c.i.f.

COPPERAS, GREEN.—In moderate demand for export. Now quoted £3 17s. 6d. per ton, f.o.b. U.K. ports.

COPPER SULPHATE 99/100%.—Price for British material £23 10s. per ton, f.o.b. U.K. ports. Moderate inquiry for export. Continental on offer at about £22 per ton, ex wharf.

FORMALDEHYDE 40%.—Quoted £38 per ton, c.i.f. U.K. ports. Spot material available at about £39 5s. per ton, ex store.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental on offer at about £3 per ton, c.i.f. U.K. ports.

LEAD, RED.—Imported material quoted £41 10s. per ton, ex store. On offer to come forward at £40 10s. per ton, c.i.f. U.K. ports.

LEAD, WHITE.—Quoted £41 5s., ex store, spot delivery.

LEAD ACETATE.—Spot material on offer at about £44 10s. per ton, ex store; on offer from the Continent at £43 per ton, c.i.f. U.K. ports. Brown quality about £38 5s. per ton, c.i.f. U.K. ports.

MAGNESITE, GROUND CALCINED.—In moderate demand and price unchanged at about £8 15s. per ton, ex station.

POTASH CAUSTIC, 88/92%.—Syndicate prices vary from £25 10s. to £28 15s. per ton. c.i.f. U.K. ports, according to quantity and destination. Spot material available at about £29 per ton, ex store.

POTASSIUM BICHROMATE.—Unchanged at 4½d. per lb., delivered.

POTASSIUM CARBONATE.—96/98% quality quoted £25 10s. per ton, ex wharf, early delivery. Spot material available at about £26 10s. per ton, ex store. 90/92% quality quoted £22 10s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99/100%.—A quantity of crystals available at £31 10s. per ton c.i.f. U.K. ports. Powdered quality on offer at about £30 per ton, c.i.f. U.K. ports.

POTASSIUM NITRATE, SALTPETRE.—Quoted £22 15s. per ton, c.i.f. U.K. ports, prompt shipment. Spot material available at about £25 10s. per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Spot material quoted 8d. per lb., ex store. Offered for early delivery at 7½d. per lb., ex wharf.

POTASSIUM PRUSSIATE, YELLOW.—Offered for prompt shipment ex Continent at about 7¼d. per lb., c.i.f. U.K. ports. Spot material available at about 7⅝d. per lb., ex store.

SODA CAUSTIC.—76/77%, £17 10s. per ton; 70/72%, £16 2s. 6d. per ton; broken 60%, £16 12s. 6d. per ton; powdered 98/99%, £20 17s. 6d. per ton. All carriage paid U.K. stations, spot delivery. Contracts 20s. per ton less.

SODIUM ACETATE.—Very scarce for spot delivery, quoted £22 per ton c.i.f. U.K. ports. Prompt shipment from the Continent.

SODIUM BICARBONATE.—Refined recrystallised quality £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less.

SODIUM BICHROMATE.—English price unchanged at 3½d. per lb. delivered.

SODIUM CARBONATE.—Soda crystals, £5 to £5 5s. per ton, ex quay or station; powdered or pea quality, £1 7s. 6d. per ton more; alkali 58%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 per ton, ex station, minimum four-ton lots. Pea crystals £14 5s. per ton, ex station; Continental commercial quality offered £9 per ton, ex store.

SODIUM NITRATE.—Quoted £13 per ton, ex store. 96/98% refined quality 7s. 6d. per ton extra.

SODIUM NITRITE, 100%.—Quoted £24 per ton, ex store. Offered from the Continent about £22 5s. per ton, c.i.f. U.K. ports.

SODIUM PRUSSIATE, YELLOW.—Spot material on offer at 4½d. per lb., ex store. Offered from the Continent for prompt shipment at about the same figure.

SODIUM SULPHATE, SALTCAKE.—Price for home consumption £3 10s. per ton, ex works; good inquiry for export and higher prices obtainable.

SODIUM SULPHIDE.—60/65% solid, £13 5s. per ton; broken £14 5s. per ton; flake £15 5s. per ton; crystals 31/34%, £8 12s. 6d. per ton. All delivered buyers' works U.K. minimum five-ton lots, with slight reduction for contracts. 60/62% solid quality offered from the Continent at about £10 10s. per ton, c.i.f. U.K. ports; broken £1 per ton more; crystals 30/32% £7 10s. per ton, c.i.f. U.K. ports.

SULPHUR.—Flowers, £11 per ton; roll, £9 15s. per ton; rock. £9 15s. per ton; ground, £9 10s. per ton, ex store, spot delivery. Prices nominal.

ZINC CHLORIDE.—British material 95/98% quoted about £24 per ton f.o.b. U.K. ports, 98/100% solid on offer from the Continent at about £22 10s. per ton, c.i.f. U.K. ports. Powdered about 20s. per ton extra.

ZINC SULPHATE.—Continental manufacture on offer at about £11 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Coal Tar Intermediates and Wood Distillation Products

ALPHA NAPHTHOL.—2s. per lb. Some home inquiries.

SULPHANILIC ACID.—9d. per lb. Some home inquiries.

BETA NAPHTHOL.—11d. to 1s. per lb. Fair home inquiries.

PARANITRANILINE.—1s. 10d. per lb. Small home inquiries.

ORTHONITROTOLUOL.—5d. per lb. Fair home inquiries.

BENZALDEHYDE.—2s. 2d. to 2s. 3d. per lb. Small home inquiries.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, February 19, 1926.

The net result of the mixed conditions in the textile industries —improvement in some centres and depression in others— is that the demand for chemicals in that direction keeps at much the same relatively low level. In other respects business is on a fair scale and there are few weak spots in the price situation, the tone of the market being steady on the whole. As regards export demand, shipments have been confined to a few small parcels, the requirements of Canada and India, as well as of the Continent generally, being easily satisfied.

Heavy Chemicals

Only a limited amount of business is passing in hyposulphite of soda at £9 15s. per ton for commercial, and £14 to £14 5s. per ton for photographic crystals. Not a great deal of trade is being done either in sulphide of sodium, though values are rather steadier; 60-65 per cent. concentrated solid being quoted at about £11 5s. per ton and commercial material at £9 15s. Saltcake and glauber salts keep slow and nominally without change as to price, values being at £3 and £3 5s. per ton respectively. Bleaching powder is in moderate request and is steady at about £8 10s. per ton. Acetate of soda is fully maintained at about £19 10s. per ton. Caustic soda meets with a quietly steady demand at firm rates, ranging from £15 2s. 6d. for 60 per cent. to £17 10s. to 76-77 per cent. quality. Phosphate of soda is inactive but prices are steadier at £12 5s. per ton. Bichromate of soda has changed but little, 3¼d. per lb. still being the current quotation; demand, however, is slow. Prussiate of soda is quiet but steady at about 4¼d. per lb. Soda crystals meet with a fair amount of inquiry and values are held at about £5 5s. per ton. Alkali is still on offer at £6 15s. per ton. Chlorate of soda is steady though in rather quiet demand at 3⅛d. per lb. Bicarbonate of soda is fairly steady at round £10 10s. per ton, but business is rather slow.

The price of caustic potash is being pretty well maintained though the demand cannot be described as brisk; 90 per cent. quality is quoted at about £27 10s. per ton. Carbonate of potash keeps steady and meets with a fair amount of inquiry at £25 10s. to £26 per ton for 96 per cent. Chlorate of potash is still on offer at 4d. per lb. Permanganate is rather slow and easy at 7¼d. per lb. for pharmaceutical quality and about 5½d. for commercial. Yellow prussiate of potash is firm in spite of a sluggish demand, round 7¼d. per lb. being asked. Bichromate of potash is quiet and prices are on the easy side at 4¼d. to 4½d. per lb.

Business in arsenic continues to be rather slow at £14 per ton for white powdered, Cornish makes, f.o.r. at mines. Sulphate of copper values are still at £24 to £24 5s. per ton, but not much trade is passing. Epsom salts at £3 10s. to £3 15s. per ton are little changed though demand is still only moderate; magnesium sulphate, B.P. quality, is steady at £4 10s. Nitrate of lead is slow at round £40 per ton. White acetate of lead is in limited inquiry at £44 per ton, with brown quoted at about £39. Acetate of lime is firm at about £17 10s. per ton for grey and £8 5s. per ton for brown.

Acids and Tar Products

There is a slightly better tone in the market for acids though business is still on the quiet side. Oxalic acid is selling in limited quantities at 3⅝d. to 3¾d. per lb. Commercial acetic acid is steady at £36 to £37 per ton for 80 per cent. and about £67 for glacial. Citric acid stands at 1s. 3¼d. to 1s. 3½d. per lb. and tartaric acid at round 11½d.

Pitch prices continue firm and a fair demand is being met with; up to 57s. 6d. per ton, alongside ship, is still being quoted here. Solvent naphtha is steady and in moderate request at about 1s. 6d. per gallon. Creosote oil is well held at 6¾d. per gallon. Very little demand is being met with for carbolic acid; crystal is nominal at round 5d. per lb. and crude material at 1s. 5d. per gallon.

Preservatives in Food

At the annual meeting of Borax Consolidated, Ltd., which was held in London on Wednesday, the Earl of Chichester, who presided, said that the volume of the company's business had held up during the past year, notwithstanding a considerable amount of competition at low prices from American sources. With regard to the food-preservative regulations formulated by the Government, he said that during the year further competent medical evidence had become available in addition to that which was previously on record, emphasising that boron preservatives were not harmful. There had also been a large accumulation of evidence that the proposed regulations would lead to great loss and difficulties in the distribution of perishable food products, including those from our Colonies, with a consequent very probable increase in the cost of such food products to the consumer, and the danger of their consumption in a condition harmful to health. They were of opinion that the regulations had been framed upon purely negative and inconclusive evidence, and that an unbiassed and thoroughly scientific investigation would establish up to the hilt their claim that boron preservatives are harmless used in the small proportions that are necessary.

They had offered, and are still ready, to bear their share of the expense of such an independent investigation, and to assist in elucidating the truth by every means at their disposal. They hoped that before the regulations came into force this necessary investigation would be undertaken by the authorities, and that if prohibition was to be enforced it, would be upon positive and not negative evidence.

Birmingham University Developments

The Council of the University of Birmingham, in a report to the Court of Governors, state that tenders have been accepted for the foundation and superstructure of the new Biological Departments on the Edgbaston site. A new laboratory for purposes of research in coal treatment has been erected for the Mining Department. The cost, with equipment, has been met by a grant from the Central Committee of the Miners' Welfare Fund, supplemented by donations and gifts of machinery received through Professor Moss.

Mr. C. C. Elvins, M.Sc., has been appointed Research Assistant in the Department of Oil Engineering and Refining, in place of Mr. A. Bowen, appointed to succeed Mr. Shatwell.

The title of Emeritus Professor has been conferred by the University of Birmingham upon Sir John Cadman, late Professor of Mining in the University,

The thanks of the Council have been passed for the undermentioned gifts, etc., to the British Burmah Petroleum Co., Scholarship, value £60 a year, for three years, for students in the old Engineering and Refining Department; to the Mining Association of Great Britain, for valuable models for the Mining Department; to W. and T. Avery, for special weighing machine for use in the Fuel Treatment Laboratory in the Mining Department.

Leather Finishing Secret Process Case

A case relating to leather pigments was heard before Judge McCarthy at Otley County Court on Wednesday, when the Kepec Co., of the United States, with a branch at Otley, sought an injunction and £10 damages against Fred Farrington, of The Green, Newall, Otley, who up to recently had been in their employment. The Kepec Co. are manufacturers of pigment finishes for leather by a secret process. The secret turned on the preparation and mixing of the ingredients, but the process was simple. It was stated for the plaintiffs that the defendant left them of his own volition and later started negotiations with a Brussels firm. A director of the Otley company said that formerly aniline dyes were used for leather treatment, but the American invention of pigment finishes had revolutionised the trade, as they coloured and finished simultaneously. It was stated that the defendant had not given vital information to the Brussels firm, because he had not got his price, but names of the makers of special machinery had been disclosed.

His Honour granted an injunction and gave judgmen tin favour of the plaintiff company, with costs.

Company News

EASTMAN KODAK OF NEW JERSEY.—The regular dividend of $1.25 and an extra dividend of 75c. per share has been declared on the common stock.

GERMAN POTASH LOAN.—It is believed that the second instalment of the German Potash loan will be issued during the second half of March. The amount is expected to be about £5,000,000.

BROKEN HILL SOUTH.—The estimated surplus for the half-year ended December 31 was £310,000, after deducting allowances for taxation, depreciation of plant, and provision for redemption of debentures.

"SOIE DE CHATILLON."—At a meeting of the shareholders of this Italian artificial silk company, to be held on February 28, the directors will propose the increase of the company's capital from 150,000,000 lire to 200,000,000 lire.

UNITED TURKEY RED.—The directors recommend a final dividend on the ordinary shares of 7 per cent., less tax, making 10 per cent. for the year. A sum of £40,000 is placed to reserve, £10,000 to investment contingency account, and £39,000 is carried forward.

CROSSLEY BROTHERS.—The net profit for 1925 amounts to £60,383 and £19,075 was brought forward. It is proposed to pay a further dividend for the second half of the year at the rate of 7 per cent. per annum on the preference shares, and to carry forward £51,221.

UNITED ALKALI CO., LTD.—The directors announce a final dividend on the ordinary shares of 6 per cent., less tax, making 10 per cent. for the year to December last, carrying forward £100,000. The dividend for the corresponding period last year was 7½ per cent., making 12½ per cent. for the year 1924.

BRITISH DRUG HOUSES, LTD.—An issue of 255,500 ordinary shares of £1 is expected to be made shortly. Including the proposed new issue, the company will have a subscribed capital of £642,000, of which £242,000 is in 5 per cent. cumulative preference shares and the balance of £400,000 is in ordinary shares.

INTERNATIONAL PAINT AND COMPOSITIONS, LTD.—A final dividend of 5 per cent. on the ordinary shares, less income tax, is recommended, making 7 per cent. for the year ended December 31 last. The usual half-yearly final preference dividend of 3 per cent.—namely 6 per cent. per annum—is also recommended, less income tax.

WILLIAM GOSSAGE AND SONS.—The report to November 30 last states that, after providing for all charges, the balance at the credit of profit and loss amounts to £175,787. The board propose a dividend on the 5 per cent. first cumulative preference, a dividend on the 6½ per cent. cumulative preference and a dividend of 20 per cent. on the ordinary shares, carrying forward £4,537.

BRITISH ALIZARINE CO.—The accounts for the year ended December 31 last show a profit of £25,977, to which must be added £52,849 brought forward. The directors have, under powers vested in them by the company's articles of association, written off £21,338, and recommend that the balance of £57,488 be carried forward. The annual meeting will be held in Manchester on February 22, at 3 p.m.

E. I. DU PONT DE NEMOURS AND CO.—The annual report to the stockholders shows $24,033,957 consolidated net income for the year, which, after providing for interest on funded debt, equals 5·85 times the debenture stock dividends for the year and, after allowing for dividend on debenture stock, the remaining net income of $19,928,626 is equivalent to $14.97 per share upon the common stock outstanding at the end of the year.

AMALGAMATED ZINC (DE BAVAY'S), LTD.—A meeting is called for February 25 at Melbourne to consider the reduction of the capital from £500,000 in £1 shares to £200,000 in 500,000 shares of 8s. each, by returning 12s. per share. Such return is to be made by distributing 300,000 ordinary shares of £1 each now held by the company in Electrolytic Zinc Co. of Australasia, Ltd., in the proportion of three of such shares for every five de Bavay shares held on the date of confirmation of the resolution.

BRADFORD DYERS' ASSOCIATION.—For the past year the accounts show that after providing an estimated amount in respect of the employees' bonus register, income tax and other contingencies, the profit amounts to £680,940, to which has to be added £657,645 brought forward, making a total of £1,338,585. Debenture interest requires £58,150, stamp duty on increase of authorised capital and cost of issue of new ordinary shares £11,568, and depreciation £221,991. A final dividend is recommended on the ordinary shares at the rate of 2s. per share, making 2s. 7½d. per share for the year; £80,000 is appropriated for the benefit of employees, and a balance of £557,016 is to be carried forward. The annual meeting will be held on February 26, and the dividend on the ordinary shares will be paid on March 6.

COURTAULDS, LTD.—The profits for 1925 after charging all taxation and depreciations and expenses, and after carrying £500,000 to the special reserve account which has been set up in connection with the proposed pensions scheme for the company's employees, and £200,000 to special reserve account for insurance, amount to £4,411,413. The directors have decided to carry £1,000,000 to general reserve account and to recommend the payment of a final dividend on the ordinary shares for 1925 of 3s. 6d. per share, free of income tax, and to carry forward the balance of £1,046,006. For the previous year the profits, after carrying £400,000 to special reserve account for insurance and £250,000 to a special reserve account for employees' old age allowances, etc., amounted to £3,880,744. The directors decided on that occasion to carry £1,000,000 to general reserve account, and to recommend the payment of a final dividend for 1924 of 2s. 9d. per share, free of tax, and to carry forward £1,034,594.

Tariff Changes

SIERRA LEONE.—The export of palm oil is prohibite unless of standard specification.

PALESTINE.—Following may now be imported duty free :—Cotton seed, linseed, colza, palm and olive seed, caustic soda, aniline and indigo and other dyes.

TURKEY.—Bills recently passed to institute petroleum and sugar monopolies are expected to prohibit the importation of petroleum, benzine, and sugar (raw, refined, and glucose), except on Government account.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

PAINTS, OILS, ETC.—The Chilean State Railways require for the current year lubricating and illuminating oils, grease, paints, varnishes, and painting utensils, ingots, and materials for casting. Local representation essential. Full details from the D.O.T. (Reference C.1882.)

PAINTS, OILS, SOAPS, ETC.—The Frontier Districts Administration, Egypt, invites tenders for oils, paints, and soap. Details from the D.O.T. (Reference C.X.1888.)

FERTILISERS, ETC.—An agent in Cape Town wishes to handle British fertilisers, spraying materials, and roofing materials. (Reference 205.)

FATS, INSULIN, ETC.—Commission agents in Warsaw desire Polish representation for British fats for soap making, talc, shellac, insulin, and other pharmaceutical productions. (Reference 217.)

CHEMICALS.—A British agent in Mersina, Turkey, desires representation for Silicia of British industrial and pharmaceutical chemicals. (Reference 222.)

MINERAL OILS, ETC.—A Barcelona agent wishes to represent British firms exporting mineral oils and raw materials for paint and varnish trade. (Reference 220.)

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

ISIS CHEMICAL AND DYES, LTD. (foreign corporation), Providence Wharf, 81, Banning Street, East Greenwich. (C.C., 20/2/26.) £20 0s. 6d. September 30.

ZOGAL, Madame (a firm), 57, The Crescent, South Shore, Blackpool, wholesale chemists' manufacturers. (C.C., 20/2/26.) £13 13s. 9d. January 5.

Bill of Sale

WATT, William Henry, 37, Sotheby Road, Highbury, and 24, The Minories, E., chemical merchant. (B.S., 20/2/26.) Given February 11. Filed February 12. £100.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

GIBBS (D. AND W.), LTD., London, E., soap manufacturers. (M., 20/2/26.) Registered January 26, Land Registry charge (supplemental to Trust Deed dated November 12, 1900, securing £60,000 debenture stock, of which £19,660 is outstanding); charged on City Soap Works and 122, High Street, Wapping. *£19,660. May 5, 1925.

POLYSULPHIN CO., LTD., Keynsham, chemical and soap manufacturers. (M., 20/2/26.) Registered February 1. £16,000 debentures; general charge. *Nil. January 12, 1926.

PURITAS DISINFECTANTS CO., LTD., Leicester. (M., 20/2/26.) Registered February 2, £2,000 second mortgage, to Lady M. E. Walters, 6, Hobart Place, Eaton Square, S.W.; charged on property in Evington Valley Road, Leicester (subject to prior mortgage). *£4,000. December 5, 1924.

Satisfaction

PREMIER DYEING AND FINISHING CO., LTD., Leek. (M.S., 20/2/26.) Satisfaction registered February 9, £2,700, part of amounts registered August 4, 1922, and February 13, 1924.

Receivership

KAPPA WORKS, LTD. (R., 20/2/26.) W. Hancock, of 78, Queen Victoria Street, E.C.4, ceased to act as receiver or manager on January 22, 1926.

London Gazette, &c.

Companies Winding Up Voluntarily

LEE GREEN GLASS MANUFACTURING CO., LTD. (C.W.U.V., 20/2/26.) W. S. Warren, incorporated accountant, 8–9, Martin Lane, Cannon Street, E.C.4, appointed liquidator, February 5.

PLEXTER CHEMICAL CO., LTD. (C.W.U.V., 20/2/26.) Robert Crawford, solicitor, 29, Nicolson Street, Greenock, appointed liquidator, February 10. Meeting of creditors at the registered office of the company, 41, Cogan Street, Pollokshaws, Glasgow, on Friday, February 26, 1926, at 12 noon.

RIGBY (J. J.), LTD. (C.W.U.V., 20/2/26.) Sir Thomas Smethurst, 26, Pall Mall, Manchester, chartered accountant, appointed liquidator, February 5.

Notice of Intended Dividend

WOODS, Frederick, 38A, Shepherd Street, Preston, soap manufacturer. Last day for receiving proofs, March 2. Trustee, H. Parker, 11, Winckley Square, Preston, Official Receiver.

Partnerships Dissolved

WATERS (S. F.) AND CO. (Sidney Frank WATERS, Hardy Bedwell WATERS, Eric Noel WATERS and Philip William MILNER), sulphate ammonia merchants, 85, Gracechurch Street, London, by mutual consent as from Jan. 30, 1926.

Business Names Registered

[The following (trading name and address, nature of business, date of commencement, and proprietors' names and addresses) have been registered under the Registration of Business Names Act.]

IRON-OX SUPPLY CO., 37, Gray's Inn Road, W.C.1, proprietary manufacturer. January 18, 1926. Sidney F. Ely, 132, Auckland Road, Upper Norwood, S.E.

MARINE CHEMICAL CO., Arthur Street Chambers, 8–10, Monument Street, E.C.3, manufacturers and merchants. January 18, 1926. Ernest A. Kittle, 9, St. Charles Square, North Kensington, W.10, and Edwin G. M. White.

NORWICH CHEMICAL CO., 15, Rose Lane, Norwich, chilblain liniment manufacturers, etc. December 16, 1925. Edward Blyth, 10, Cock and Pie Yard, Quay Side, Norwich.

PREMIER REFINING CO., 10, Meldon Terrace, Newcastle-on-Tyne, oil and grease merchants. January 1, 1926. Ralph E. Probert, 10, Meldon Terrace, Newcastle-on-Tyne.

New Companies Registered

CAER CHEMICAL CO., LTD.—Registered February 10, 1926. Manufacturers of sulphuric, hydrochloric, nitric, phosphoric and other acids and derivatives thereof, sulphides, sulphites, sulphates, chlorides, chlorates, pigments, dyes, colours, paints, tar, etc. Nominal capital, £4,000 in £1 shares. Solicitors: Porter and Co., Conway.

HALTHORPE CO., LTD.—Registered February 11, 1926. To acquire and deal with collieries, mines and minerals in Great Britain or elsewhere; to extract, transport, refine, etc., oils; to deal in coal, coke, products of tar distillation, chemicals, fuel, etc. Nominal capital, £1,000 in £1 shares. Solicitors: Parker, Rhodes and Co., 10, Moorgate Street, Rotherham.

S.S. PRODUCTS, LTD.—Registered February 12, 1926. To acquire a secret process for the manufacture of synthetic shellac and of various products arising or derivable therefrom. Nominal capital, £1,000 in £1 shares (400 "A" ordinary and 600 "B" ordinary). A director: D. Robinson, 8, Broomfield View, Leeds.

Optical Society's New Officers

AT the annual general meeting of the Optical Society at South Kensington on Thursday, February 11, the following officers and members of Council were elected for the session 1926-1927:—President, Mr. T. Smith; Vice-Presidents, Inst.-Comdr. T. Y. Baker, Mr. F. F. S. Bryson, Dr. R. S. Clay, and Mr. H. H. Emsley; Treasurer, Major E. O. Henrici; Secretaries, Professor A. Pollard and Mr. F. F. S. Bryson; Librarian, Mr. J. H. Sutcliffe; Editor, Mr. John S. Anderson; Members of Council: Messrs. D. Baxandall, W. M. Brett, W. B. Coutts, A. H. Emerson, E. F. Fincham, J. Guild, E. T. Hanson, H. C. Raxworthy, J. Rheinberg, G. F. C. Searle, W. Swaine and F. C. Watts.

Heat Flow Meters for Furnace Walls

A STUDY of heat flow meters for furnace walls is being conducted by the U.S. Bureau of Mines. The purpose is to develop meters for the measurement of heat flow from kiln walls, boiler settings, surfaces of coal in mines, and similar problems. Seven meters have been constructed, 2 ft. square and about 3/22nd inch thick, and have been partly calibrated by passing known rates of heat flow through them. When the calibration has been completed they will be available for special investigations on the flow of heat through refractory walls and for obtaining a measure of the radiation from boilers, kilns, etc., during an efficiency test.